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Horticultural Therapy in Tennessee

Jenny Cecilia Pfeffer
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a thesis written by Jenny Cecilia Pfeffer entitled "Horticultural Therapy in Tennessee." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Plant Sciences.

Dennis Deyton, Major Professor

We have read this thesis and recommend its acceptance:

J. Mark Fly, Susan Hamilton, Curtis Stewart

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

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Horticultural Therapy in Tennessee

A Thesis Presented for
The Master of Science
Degree
The University of Tennessee, Knoxville

Jenny Cecilia Pfeffer
December, 2007

DEDICATION

I dedicate this thesis to my “beautiful family.” Thank you for your support
And putting on with me on the last two years!!
I love you all.

Stephanie and Vanessa, please always remember, “it is never too late to follow your dreams and always put your heart in everything you do.

Los quiero tu mucho!!

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ABSTRACT

The purpose of the study was conducted to identify the existing HT programs in Tennessee and to locate the types of institutions, staff, activities, and clientele involved in those programs. Horticulture as a therapeutic medium is increasing rapidly, especially in the U.S., and there is a significant need to compile information about available programs in Tennessee. The Web-Survey of Horticultural Therapy Programs in Tennessee was developed and used in spring 2007 to survey members of the Tennessee Hospital Association, the Tennessee Association of Homes and Services for the Aging, the Tennessee Master Gardeners; the Manager of Knoxville Sertoma Center Greenhouse; the directors of Cheekwood Botanic Garden, Nashville, Ijams Nature Center, Knoxville, and the Memphis Botanic Garden. The estimated population for this survey was 1,314 (=N) participants. Two hundred eighty four people started to take the survey and 198 of those completed it successfully. These participants were a little-to somewhat familiar with the use of horticulture as a tool for therapy.

The results of the survey indicated there are at least 12 (=n) HT programs in Tennessee. The study showed that each horticultural therapy program was individualized depending on the type of client served, the type of funding of the institution, and the resources available for the horticultural therapy program. The survey found that the main purpose of the HT programs in Tennessee was to “improve mood” of their clients, following by “social interaction,” “stress reduction” and “motor skill development.” Ninety-one percent of respondents felt there was a need for an association in Tennessee, and 86% felt that there was a need for professional HT in Tennessee.

A restive-healing garden was designed at the Parkwest Medical Center, Knoxville. The multi-use rooftop garden was designed for patients and staff to provide feelings of security in a home-like deck environment where patients might receive individual and/or group recreational therapy, physical therapy, and horticultural therapy; provide opportunities to relieve tension, frustration and aggression; provide opportunities for reflection, relaxation and privacy for staff and patients; provide opportunities for different social and recreational activities; and provide stimulation of the senses with color, smells, textures, and sound.

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CHAPTER I

INTRODUCTION AND GENERAL INFORMATION

Abstract

Horticultural therapy (HT) is the mix of two fields: horticulture and therapy. It is a profession that uses the working with plants as a tool in therapy in a wide variety of settings to improve outcomes of the cognitive, social, emotional, and physical aspects of their clients. Horticultural therapy has been successful in the treatment of people with mental and physical disabilities, and in the training of people for new job skills. It has also been proven to be beneficial with special populations, such as older adults, abused women and children, medically or terminally ill patients, prisoners, and addiction rehabilitation groups.

In the first chapter, gardening, horticulture, therapy, horticultural therapy, and therapeutic horticulture will be defined because the frequent use of these terms in the thesis. The chapter also reviews the benefits of horticultural therapy, the most common benefits from the use of these HT programs, it's most usual settings, and the theoretical rationale that led to the development of horticultural therapy as a profession.

Introduction

Gardening connects us with nature. There is something calming, empowering, and reassuring about being part of the plant growing process. The use of the calming powers of nature and plants as means for healing people to escape from the stress and competition of our daily life is increasing tremendously in these busy modern times. Through gardening, each individual can be part of nature (Lewis, 1996).

Gardening as a therapeutic practice, a wisdom persisting from the distance past, has been rediscovered by the health care professions. Horticulture has been used as therapy even before psychiatry became a science. The first recorded use of horticulture in a treatment context occurred in ancient Egypt (Lewis, 1976). The therapeutic value of plants is not limited to gardens. It can be found in the form of containerized plants on a windowsill or patio. Also, the therapeutic role of gardening is not limited to professionals working with special or handicapped populations; the therapeutic benefits of gardening and horticulture are available to everyone.

Horticultural therapy (HT) is the mix of two fields: horticulture and therapy. It is a profession that uses horticulture, or the act of working with plants, as a tool in therapy to improve outcomes of the cognitive, social, emotional, and physical aspects of their clients. Horticultural therapy has been successful in the treatment of people with mental and physical disabilities, and in the training of people for new job skills. It has also been proven to be beneficial with special populations, such as older adults, abused women and children, medically or terminally ill patients, prisoners, and addiction rehabilitation groups (Relf, 1995).

Literature Review

Terms and Definitions

In the literature, the terms “gardening” and “horticulture” are used interchangeably. According to Webster’s online dictionary “gardening” is defined as the cultivation of plants. Gardening is also defined as an activity, the art and craft of growing plants. “Horticulture” is also defined as the cultivation of plants, but Webster’s provides the more detailed meaning of the word, as follows: the Latin words *hortus* (garden plant) and *cultura* (culture) together form horticulture, classically defined as the culture or growing of garden plants. Horticulture is, however, much more. By the newly developed definition, horticulture encompasses plants and people, whose active and passive involvement with “the garden” brings about benefits to them as individuals and to the communities and cultures they comprise (Relf, 1992).

There are also several definitions of “therapy.” In www.dictionary.com, therapy is defined as: treatment of disease or disorders, as by some remedial, rehabilitating, or curative process, e.g. speech therapy; a curative power or quality; any act, hobby, task, program, etc, that relieves tension. Webster’s dictionary defines therapy as the act of caring for someone (as by medication or remedial training, etc.).

The terms ‘horticultural therapy’ and ‘therapeutic horticulture’ are also frequently used interchanged. Thrive, a charitable organization in the United Kingdom, uses the following definitions: “horticultural therapy is the use of plants by a trained professional as a medium through which certain clinically defined goals may be met;” and “therapeutic horticulture is the process by which individuals may develop well-being

using plants and horticulture. This is achieved by active or passive involvement (Sempik et al., 2003). Another definition of horticultural therapy is given by Steven Davis (1994), former President of the American Horticultural Therapy Association: “Horticultural therapy is the use of plants and gardening activities as vehicles in professionally conducted programs in therapy and rehabilitation.”

Benefits of Horticultural Therapy

Horticultural therapy programs can be found in health care facilities and social service organizations. The sense of feeling better when visiting a park, working in the garden, or taking a walk through nature, is universal. Plants do not care the color of a person’s skin, if they are blind, or use a wheelchair. Experiencing contact with plants and the joy of physical and mental activity stimulates the senses for all.

Studies on people-plant interactions have shown that passive and active participation with plants and the natural environment can have profound effect on human well-being. Research trials by Kaplan (1973), Ulrich (1984), Ulrich and Simons (1986), Talbot and Kaplan (1991), Mooney (1994), and Marcus and Barnes (1995) have shown people-plants interactions have positive impacts on human well-being.

Some benefits obtained from using horticulture as therapeutic tool are stress reduction and relaxation; cognitive and social growth; learning opportunities of new skills; and psychological, physical, and spiritual growth.

Stress reduction and relaxation: Through the non-threatening environments of greenhouses, gardens and plant areas, people can build self-esteem and feelings of independence (Henson, 1994). Natural environments with plants can foster faster

recovery from stress (Ulrich et al., 1991; Kaplan, 1995), increase positive feelings, and hold attention effectively and hence block stressful thoughts (Ulrich and Parsons, 1992).

Both Ulrich and Kaplan have demonstrated that scenes of nature/vegetation were preferred significantly over scenes of buildings, and Ulrich and Simons (1986) demonstrated that recovery from stress, based on physiological measurements, was faster when viewing scenes of nature.

The benefits of gardens in stress reduction and relaxation in the healthcare environment can be experienced by everybody: the patients, the staff, care providers and family members. For a brief period of time, it can provide a relief from the causes of stress and grief (Cooper-Marcus, 1999). In the book "Healing Gardens" (Cooper Marcus and Barnes, 1995), Roger Ulrich discussed the control-related benefit called 'temporary escape' as being as being of high importance in restoration from stress.

Cognitive benefits: Nixon and Read (1998) reported that gardening or working with plants could increase attention span; raise concentration levels; and improved problem solving skills and the ability to follow directions. The concepts of quantity, counting, and math were developed when the clients needed to count seeds, pots, trays, etc (Bruce, 1999). Kaplan and Kaplan (1989) stated that natural environments can enhance the ability for patients to concentrate and make decisions. Haller and Kramer (2006) stated that many cognitive benefits can be accomplished with horticultural activities as: orientation of time and place incorporating holidays and seasons, "checking in" about the progress on planting projects to give participants a measure for time.

Social benefits: Horticultural therapy activities provide opportunities for group activities and sharing of experiences. Working as a part of a group in horticultural

activities encourages communication. The participants learn to work together toward common goals and to share responsibilities in a non-threatening environment (Bruce, 1999).

These social benefits can be illustrated by the conclusions of a research conducted by Steininger-Hotwagner (2004) with socially deprived adolescents in Austria. The author concluded that "A garden designed and built for the special needs of socially deprived adolescents may significantly improve the quality of life in school settings. Individuals with these special needs may not only gain professional skills but may also develop an understanding for ecological and sustainable gardening and improve their communication and social skills. The garden supplements other therapies, and fosters the student's and general public's identification with this institution."

Learning new skills or vocational options: Horticultural therapy provides people with activities of different levels of complexity on the individual capabilities. For example, it requires different skill levels to prepare soil, propagate cuttings, transplant seedlings, water, transplant, and weed a garden.

Some horticultural programs emphasize a sense of job responsibility, productive work habits, and personal appearance standards. Horticultural training may include various phases of greenhouse production, retail sales, grounds maintenance, landscaping, floral design, and nursery production. The use of horticultural therapy has given new working skills and has opened the opportunity of employment of adults with learning disabilities in the US horticultural industry (Dehart-Bennett and Relf, 1990; Sempik and Becker, 2003).

The provision of horticultural therapy has led to the development of an interest in horticulture in some of the patients and its adoption as a leisure activity or vocational goal. For example, Wichrowski et al. (1998) described the case of a patient who sustained a spinal injury as a result of a traffic accident. After rehabilitation programs which included horticultural therapy, the patient decided to pursue a career in horticulture.

Physical benefits: Many physical benefits can be achieved with horticultural therapy programs. Examples are maintenance or improvement of gross and fine motor skills, condition or strengthen muscles, standing/balance and endurance, mobility, range of motion, and improved blood circulation and respiration (Haller and Kramer, 2006). The visual encountering with nature or plants has been reported to lower the blood pressure (Ulrich et al., 1991; Lohr et al., 1996).

Ernest Moore (1981) examined factors that were correlated with rates of sick call among prisoners. He found that prisoners in cells with a view of surrounding farms and forest made fewer calls than prisoners with cell views of the prison. Roger Ulrich (1984) reported on the benefits to hospital patients having a room with a view of trees rather than a view of a brick wall. Patients recovering from gall bladder surgery who were afforded a view of nature while recovering, spent less time in the hospital, used fewer doses of strong pain relievers and had fewer negative comments from hospital staff on their charts.

Spiritual benefits: The care of plants or being in contact with them provides patients with a sense of place in the universe, a kind of communion with nature and a sense of peace and harmony. Connecting with another living entity can be an inspirational experience (Lewis, 1996).

Unruh (1997) suggested that there were three broad themes with spiritual implications in healing gardens. These were “reflections about oneself as a solitary being,” “reflections about the life cycle and one’s place in it” and “gardening as a spiritual expression of community.” This spiritual dimension can vary from the appreciation of nature and wonderment to the feelings of prayer and communion with God.

Horticultural therapy settings

Horticultural therapy programs can be found at a variety of institutions including health care facilities and social service organizations. Clients are individuals who has been diagnosed having a specific disability or disabilities that can be ameliorated if treated. Clients in HT programs are very diverse and represent all categories of disabilities (Relf, 1995). Horticultural therapy program settings can be found in nursing homes, Alzheimer’s care facilities, senior day care centers, hospice agencies and programs, assisted living communities, cancer and stroke treatment facilities, hospitals, rehabilitation units, shelters for abuse victims, homeless shelters, correctional institutions, facilities for the mentally disabled, mental health facilities, Veterans Administration, public or botanic gardens, community gardens, community parks and recreation, agencies for the blind, vocational training programs, programs for at-risk youth, and school systems.

A horticultural therapist is a trained professional who plans, coordinates, and conducts therapeutic programs that use the interaction of clients with plants or plant-related activities to facilitate client rehabilitation. Horticultural therapists can serve as

consultants, train volunteer staff, and establish new programs (Bruce, 1999). The horticultural therapist usually works as a part of an interdisciplinary treatment team which may consist of a physiatrist (physical medicine), psychiatrist, social worker, nurse, nutritionist, occupational and recreational therapist, and psychologist.

Theoretical Rationale

Research by environmental psychologists such as Kaplan and Kaplan (1973, 1982, and 1989), Roger Ulrich (1984, 1986, and 1989), and Ulrich and Parsons (1992), provides the theoretical basis of horticultural therapy. Most of this research was done by university personnel trained in scientific research methods (Sempik, 2003), and from diverse disciplines such as behavioral science, medicine, sociology and education. The Kaplans' studies contributed to the understanding of the role of plants in mental restoration from fatigue and in stress reduction. The research project "Room with a View" by Roger Ulrich in 1984 is considered a classic in the field of horticultural therapy (Lohr and Relf, 2000). It reported the health benefits of hospital patients having a room with a view of trees and compared the results with patients having a room with a view of a brick wall. He also studied psychological and physiological human responses to nature and stress reduction (Ulrich and Simons, 1986).

There are several theories discussed by Ulrich and Parsons (1992) to explain how and why being around plants can be beneficial.

1. The Overload and Arousal Theories: These theories have proposed that the building of urban environments in the modern times is excessively psychological and physiological stimulating because they have too much

noise and movement with very high levels of visual complexity. On the other hand, natural environments with a lot of vegetation and water have lower levels of complexity and less stimulation and, therefore, should be more restorative and less stressful.

2. The Early Learning Experiences Theories: These theories emphasized that "learning" was the major mechanism by which people acquired the restorative, and positive and negative responses to nature and surrounding environments. In other words, people's responses to plants were a result of their early 'learning experiences' or the cultures in which they were raised. For example, people learn to associate restoration from vacations in rural areas, or from camping, hiking, etc. Conversely, people probably have stressful associations with big cities because of traffic, work stress, and crime. According to Ulrich, this theory also supported the concept that modern Western cultures condition people to like nature and plants and to have negative feelings about cities. Relf (1992) felt that this theory failed to present adequate evidence showing the similarities of positive responses to nature by different cultures and people from different geographical places, or even those from different historical periods.
3. The Evolution Theory: The third theory proposed that our responses to plants and nature resulted from evolution; that is, since we have evolved from environments that were primarily composed of plants, we have a psychological and physiological response to them. Most evolutionary explanations have in common the thought that, as a consequence of three

million years of evolution, people today have a genetic readiness to respond positively to vegetation and water and to environments that were favorable to the well-being and survival of the early humans (Kaplan and Kaplan, 1982, and Ulrich, 1983). Ulrich et al. (1991) presented the "psycho-evolutionary theory," which stated that "humans have long adapted positively to nature for survival and therefore react with positive emotional responses when in natural or nature-related environments which influence intellect, meaning and behaviors." Although evolutionary theories have focused on aesthetic preferences for nature, the evolutionary perspective can also positively explain why certain types of nature scenes have restorative or stress-reducing effect across diverse groups of people (Ulrich and Parsons, 1992).

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CHAPTER II

A WEB SURVEY OF HORTICULTURAL THERAPY PROGRAMS IN TENNESSEE

Abstract

The study was conducted to identify the existing horticultural therapy (HT) programs in Tennessee and to locate the types of institutions, staff, activities, and clientele involved in them. Horticulture as a therapeutic medium is increasing rapidly, especially in the United States, and there is a significant need to compile information about available programs in Tennessee. The Web-Survey of Horticultural Therapy Programs in Tennessee was developed and used in late spring of 2007 to survey members of the Tennessee Hospital Association, the Tennessee Association of Homes and Services for the Aging, the Tennessee Master Gardeners; the Manager of Knoxville Sertoma Center Greenhouse; the directors of Cheekwood Botanic Garden, Nashville, of Ijams Nature Center, Knoxville, and the Memphis Botanic Garden, Memphis. The estimated population for this web survey was 1,314 (=N) participants. Two hundred eighty four people started to take the survey and 198 of those (70%) completed it successfully. These participants were a little to somewhat familiar with the use of horticulture as a tool for therapy.

The results of the survey indicated there were at least 12 (=n) HT programs in Tennessee. The study showed that each horticultural therapy program was individualized depending on the type of client served, the type of funding of the institution, and the resources available for the horticultural therapy program. The survey found that the main purpose of the HT programs in Tennessee was to “improve mood” of their clients (66%), followed by “social interaction (58%),” “stress reduction (50%)” and “motor skill development (50%).” Ninety-one percent of the 198 respondents felt there was a need for

an association in Tennessee, and eighty-six percent (86%) felt that there was a need for professional HT in Tennessee.

Introduction

Currently, horticulture as a therapy is becoming well recognized as a treatment modality for people suffering from wide range of diseases and limitations. Horticultural therapy (HT) programs are very common in hospitals, nursing homes, rehabilitation centers, prisons, and many facilities for developmentally and physically disabled people.

For these reasons, there is an important need to compile information about the prevalence of horticultural therapy programs in Tennessee, and to locate the types of institutions, staff, activities, and clientele involved in those programs. Other purposes of the study were to determine the awareness in Tennessee of horticultural therapy as an alternative therapy for patients or clients, and to determine the need to train certified horticultural therapists by The University of Tennessee.

My inspiration for this study was a survey conducted by Rhea McCandliss, the first horticultural therapist at the Menninger Clinic at Topeka, Kansas, in 1968. She surveyed 500 psychiatric hospitals in the United States and found a considerable presence of horticultural therapy programming, interest in program development, and a deficiency in the number of professionally trained horticultural therapists available to meet the existing demand (Lewis, 1976).

Study Purpose

The primary purpose of this study was to gather information to describe and characterize the horticultural therapy programs present in Tennessee, the types of

institutions, staff, activities, and clientele involved in those programs, and the need for education and training in horticultural therapy.

Research Objectives

1. Determine the awareness of horticulture as a tool in therapy in Tennessee.
2. Determine the prevalence of horticultural therapy programs in Tennessee.
3. Determine what types of institutions are involved with horticultural therapy, the clientele served, and the activities offered in these programs.
4. Determine the awareness and prevalence of therapeutic horticulture in Tennessee.
5. Determine the need to train certified therapists by The University of Tennessee.
6. Determine the need to compile a directory that will be available to those institutions upon their request.

Survey Participants

The population of this survey was all members of the Tennessee Hospital Association, all members of the Tennessee Association of Homes and Services for the Aging, and the Tennessee Master Gardener List serve. Horticultural therapy programs are also used in many types of institutions or organizations of social care such as healthcare and rehabilitative institutions, community gardens, vocational training and correctional facilities, schools and botanical gardens. Therefore, surveys were also sent to the Manager of Sertoma Center Greenhouse, Knoxville, TN, the Director of Cheekwood

Botanic Garden, Nashville, TN; the Executive Director of Ijams Nature Center; and the Executive Director of Memphis Botanic Garden.

To help frame this study and how horticultural therapy programs have been growing so rapidly around the world, a brief historical situation of horticultural therapy in the United States and other parts of the world was done in the following literature review.

Literature Review

Origins and present situation of Horticultural Therapy in the United States

Horticultural therapy is a relatively new profession developed by early practitioners who used gardening activities to improve the well being of their patients or clients, and saw the beneficial changes in the people they worked with. It is also one of the oldest disciplines known. Historically, horticulture was used as an activity or leisure activity for hospital patients, for vocational training, and in occupational therapy (Shoemaker, 2004). People in early history had the need for connection with the beauty of natural environments (Lewis, 1996). The ancient civilizations accepted this as a natural part of their existence. In fact, many different tribes of Native Americans in the United States saw their surrounding vegetation and food crops as a central part of their spiritual heritage (Buchanan, 1997).

Historically, plants have been associated with healing. Most indigenous people of the American Indians, African tribes, and Australian aboriginals, etc. viewed the earth as their Mother, and saw a very spiritual connection between themselves and the plants that surrounded and were accessible to them. They also knew the medicinal value of many plants (Lewis, 1996).

In Egypt, in the times of the Pharaohs, depressed and mentally ill members of the courts were taken on walks through the royal gardens (Shepard, 1967). European monks built monastic gardens for meditation, as did monks in Tibet. Royalty throughout time has expended great sums of money and effort on the creation of calming gardens, from the hanging gardens of Babylon to the courts of Europe. In Spain, it was noticed during medieval times that impoverished hospital patients who worked in the gardens to pay their bills, had better recovery rates than the wealthy patients who did not spend time in the gardens (Davis, 1994). Physically and mentally wounded soldiers in WWI were helped in their recovery with "healing gardens" (Bruce, 1999).

Horticultural therapy has been increasing in range and importance since the late 1700s when it was recognized the involvement with plants and gardening hurried the recovery of psychiatric patients (Tereshkovich, 1975). Horticultural therapy professional origins came from the observation of the therapeutic effects of people-plant interaction, not from scientific studies (Lewis, 1996). A physician in North Scotland was reported to be famous in the early 1800s for curing insanity by putting his patients to work on his farm (Shoemaker, 2004).

Dr. Benjamin Rush is often described as the father of horticultural therapy by starting the first horticultural therapy program in the United States in Philadelphia in 1798 (Sempik and Becker, 2003). While a professor of medicine at the University of Pennsylvania, he concluded from his observations that labor on a farm and horticultural activities improved the health of mentally ill patients (Hefley, 1973). Also in Philadelphia, the Friends Hospital created the first private psychiatric institution in 1817. The hospital created shaded walks and paths, and open spaces for their patients to walk,

and involved their patients with vegetable gardens and fruit tress. The hospital still has healing gardens and a very strong horticultural therapy program (Shoemaker, 2004).

In 1896, the Children's Aid Society, under the leadership of Helen Campbell, a New York City missionary and philanthropist, was the first to use gardening as a way to help the disadvantaged young people living in the city's low income areas. Mrs. Campbell noted the positive effect of plants on these children that had a greenhouse above the bathhouse (Lewis, 1996).

In 1919, C.F. Menninger and his son created the Menninger Foundation in Topeka, Kansas. In this psychiatric institution, gardening and nature study were an integral part of the treatment program for their patients. And as Lewis stated in his book (1996), Menninger has remained a leader in the development of horticultural therapy in the United States.

In the 1940s, occupational therapists and Garden Club members used horticultural activities to help the returning veterans of World War II to restore their physical, psychologist and social well-being (Lewis, 1996). The term 'horto-therapy' was first used by Richardson Wright in 1945 (Sullivan, 1979) and in 1948 Ruth Mosher introduced the phrase 'horticultural therapy' (Olszowy, 1978).

By 1946, the pioneer Rhea McCandliss was creating gardening courses for the Veterans Hospital at Topeka, Kansas. She worked with Karl Menninger in the psychiatric residency program at the hospital. McCandliss joined the Menninger Foundation in 1959 as their horticultural therapist. She conducted a survey in 1968 to determine the extent of therapeutic horticulture programs in hospitals, and to determine the potential demand for trained professionals in the field in the United States (Shoemaker, 2004). She found a

considerable presence of horticultural therapy programming, interest in program development, and a deficiency in the number of trained, qualified persons available to meet the existing demand (Lewis, 1976).

Another horticultural therapy pioneer, Alice Burlingame, was a psychiatric social worker and occupational therapist, and together with Eleanor McCurdy initiated one the first programs specially designed as "horticultural therapy" in the 1950s (Lewis, 1996). This took place at Pontiac State Hospital in Michigan.

In 1955, O'Reilly and Handforth were among the first authors to examine the value of horticulture as a therapy for psychiatric patients (Sempik and Becker, 2003). They recorded that when therapists used horticulture as a tool in therapy, they observed an improvement in patient personal appearance and hygiene, reduced violent outbursts, increased communication, reduced isolation, and improved social functioning that created group dynamics within the activities.

The first textbook in the field of horticultural therapy was published in 1960, Therapy through Horticulture, by Alice Burlingame in collaboration with Donald Watson of Michigan State University's Horticultural Department (Lewis, 1996). Gradually, professional training courses developed and horticultural therapy gained recognition. During the 1970s several other universities started to offer horticultural therapy as an option within undergraduate and graduate degree programs (Shoemaker, 2004). In 1972, Kansas State University established the first four-year undergraduate program in cooperation with the Menninger Foundation. In the same year, a University of Maryland student received a M.S. degree on Horticultural Therapy. According to The American Horticultural Therapy Association (AHTA, 2007), there are currently two universities

offering Bachelor's and Master's degrees, one university (University of Maine) offering an associate degree in horticultural therapy, eight Horticultural Therapy Certificate programs, one online Horticultural Therapy program, and 13 other colleges or universities offering at least one course in horticultural therapy, and there are 19 educational institutions in the United States with internship opportunities.

A professional association, The National Council for Therapy and Rehabilitation through Horticulture (NCTRH), was established in 1973 to promote the horticultural therapy profession as a therapeutic intervention and rehabilitative medium (Shoemaker, 2004). The NCTRH had members and annual conferences. It became the American Horticultural Therapy Association (AHTA) in 1987 and membership within the Association and annual conferences were established.

The Interdisciplinary Research Team of the Office of Consumer Horticulture (IRTCH) was established in 1988 at Virginia Tech University. The IRTCH emphasized the human aspects of horticulture, but there was no documentation or research to support the contribution of horticulture to stress-reduction; or improvement of human behavior, human health, or interaction within communities. The first symposium of IRTCH, "The Role of Horticulture in Human Well-Being and Social Development," took place in 1990. It was so successful, that "The Plant-People Council" was formed. Since then, the Council has held a symposium every two years. The Ninth International People-Plant Symposium took place at the 27th International Horticultural Congress and Exhibition in Seoul, Korea in August of 2006. The People-Plant Council News is a quarterly publication linking horticulture with human well-being, and increasing the people's plant interaction awareness in many countries.

Horticultural Therapy is growing throughout the Americas with the United States serving as a consultant for establishment of new programs in other countries in the Americas. This emerging field is now being practiced in countries such as Canada, Mexico, Brazil, Venezuela, Cuba, Colombia and Chile (Lohr, 2000).

Horticultural Therapy in Europe

Gardening and therapy have long traditions in Europe, and since the beginning of the 20th century the combination of the two has been becoming more of a "new approach." Schools and hospitals have being using gardening as part of their programs. Some universities in England, Scotland, The United Kingdom, Germany, Italy, Norway, Sweden, Denmark, and Finland have included horticultural therapy courses in their educational programs (Evers, 2000). Multidisciplinary research approaches are being used to study people-plant interactions (Evers, 2000).

There has been an organization since 1978 in England, Scotland, and the United Kingdom (UK) called "Horticultural Therapy." The Department of Horticulture of the University of Reading was the first in the UK to develop courses in Social and Therapeutic Horticulture within the Horticulture degrees. Several independent charities have promoted the use of horticulture activities with disabled people, such as Thrive, which makes use of gardening to change the lives of disabled people. Evers (2000) and Evers et al. (2000) reported the practice of horticultural therapy was increasing in Finland. New initiatives have been developed in school gardening, environmental education, gardening in training programs for disabled people, therapeutic environments in hospitals and institutions. Horticultural education and research programs have

developed in the University of Helsinki. But, he also noted that they needed more research to convince authorities and sponsors to create more horticultural therapy programs and more therapeutic gardens in hospitals and other institutions.

Horticultural Therapy in Asia and Africa

People's interests in horticultural therapy vary from country to country in Asia and Africa. Interest in horticultural therapy can be found in countries like Hong Kong, India, Indonesia, Iran, Israel, Japan, Korea, Pakistan, People's Republic of China, Saudi Arabia, and South Africa. The research is more advanced and interest more widespread in Korea and Japan (Matsuo, 2000). Horticultural therapy has become more popular in South Korea since its introduction by Dr. B.H. Kwack at Korea University in the early 1980s through lectures and publications (Sim, 1997; Sim and Kwack, 1995). Courses were offered in horticultural therapy in several universities in Korea (Sim, 1997). Horticultural therapy programs have been implemented in hospitals, psychiatric hospitals, rehabilitation centers, and special education schools (Matsuo, 2000). Korea also has The Korean Horticultural Therapy Association and The Korean Society for Plants, People, and the Environment. Members of this society have studied construction and effects of healing gardens, school landscaping, and psychological effects of viewing landscapes.

The Oceania region is composed principally of the lands of Australia and the islands of New Zealand, New Guinea, Melanesia, Micronesia and Polynesia. In Australia and New Zealand, the therapeutic benefits of gardening were first noticed as early as the 19th century in mental institutions and farm hospitals (Aldous, 2000). Oceania has organizations such as The Horticultural Therapy Association of Victoria, The

Horticultural Therapy Society of New South Wales, Inc., and The Banksia Centre in The National Botanic Garden of Canberra specifically interested in the human- horticulture research. Aldous stated (2000) that horticulture has long been recognized as an important activity in therapy and rehabilitation, but the research and teaching aspects should be strengthened in the whole region.

Summary and Evaluation of Literature Review

Horticultural therapy programs are rapidly growing throughout the United States and different parts of the world in a rich diversity of settings and cultures. Therapeutic and restorative gardens and garden views are being added to many businesses and hospitals. Shoemaker (2004) stated that the demand for trained horticultural therapist has induced universities, colleges, botanical gardens, and other institutions to offer courses, degrees, and certification programs in horticultural therapy.

For these reasons, it was important to compile information on the prevalence of horticultural therapy programs in Tennessee, and to locate the types of institutions, staff, activities, and clientele involved in those programs. The results of the study would be made available to institutions having such programs, to institutions planning to develop programs, and to individuals that might benefit from the establishment of such programs. Also with this study, I want to determine the awareness in Tennessee of horticultural therapy as an alternative therapy for patients or clients.

Survey Methodology

A computer web-based survey (Appendix A-1) consisting of thirty two questions was developed. The opening section contained some "ice-breaker" questions concerning general interest in gardening. The next section served to gather general information about the institution where the survey participants were employed. The third section asked questions about the horticultural therapy programs offered (if present). The fourth section dealt with demographic information of clients served by horticultural therapy programs (if present); and the last section asked the participants opinions about horticultural therapy in Tennessee in general.

The distribution of the web survey was established by the University of Tennessee Office of Internet Technology Customer Tech Support staff in cooperation with the Tennessee Hospital Association, the Tennessee Association of Homes and Services for the Aging, the Tennessee Master Gardeners, Manager of Sertoma Center Greenhouse, Knoxville, Director of Cheekwood Botanic Garden, Nashville, Executive Director of Ijams Nature Center, Knoxville, and the Executive Director of Memphis Botanic Garden. An initial email requesting participation in the web survey was sent on May 30, 2007 by the leadership of each of the three organizations directly to all of their members and to the manager, director and executive directors of the organizations listed above. The email explained the purpose of the survey as well as the link to the survey (Appendix A-2). They then sent a reminder email a week later (Appendix A-3). In summary, the request to participate in the survey and the web link came from the organizations listed above instead of from The University of Tennessee. There was no identifying information in the survey responses to identify the person completing the survey. For those who

indicated they wanted to enter the drawing, receive survey results, or had an interest in a directory, then the contact information they provided was collected in a separate computer file. Therefore, the researchers did not receive identifying information connecting survey participants to their survey responses. The survey responses were anonymous. Survey results are presented as summaries in which no individual's answers can be identified. If survey participants provided contact information for the drawing, to receive results, or had interest in a directory, then the contact information they provided was considered their consent to participate in the study.

The estimated population for this web survey was approximately 1,314 participants, distributed as follows: 95 members of the Tennessee Association of Homes and Services for the Aging, 129 members of the Tennessee Hospital Association, and 1,090 members of the Master Gardener Program Listserv.

Survey Data Analysis

The data were analyzed using the Statistical Package for the Social Science (SPSS 15 for Windows). Descriptive statistics were performed on the response variables (categorical data) to meet the objectives of the web survey, including means, standard deviations, and frequency distributions. The project is considered as exploratory in nature. Data lacked statistical significance therefore standard deviations and frequency distributions are not presented.

Survey Results and Discussion

The results for this research are presented in the following section based on the study objectives and listed as research questions with their corresponding results. Of the estimated 1314 population, 284 people started to take the survey through the internet and 198 (70%) of those completed it successfully. Thus, of the total population, 15% of the people completed the survey. The population was divided into three groups with response rates listed as follows (Table 1):

1. Hospitals: thirty-four of the 129 (response rate 26%) members of the Tennessee Hospital Association invited to participate in the web-survey completed the survey.
2. Nursing Homes/Assisting Living: of the 95 members of the Tennessee Association of Homes and Services for the Aging invited to participate in the web-survey, 22 completed the survey successfully (23% response rate).
3. Master Gardeners: one hundred forty-two of the 1,090 members of the Tennessee Master Gardeners completed the survey successfully (13% response rate).

Table 1. Web-survey population groups with response rates.

Associations	Members N	Respondents n	Response Rate %
Hospitals	129	34	26
Nursing Home/Associations	95	22	23
Master Gardeners.	1,090	142	13
Total	1,314	198	15

Objective 1. Determine the awareness of horticulture as a tool in therapy.

To determine the awareness of horticulture as a tool in therapy, the following question was asked: How familiar are you with the use of horticulture as a tool for therapy? The mean response value for the 198 participants completing the survey was 2.85. Comparing the mean to the 5 point scale, where the minimum value (1) was "not at all familiar," and the maximum value (5) was "very familiar", 2.85 was interpreted as the participants being a "little to somewhat familiar" with the use of horticulture as a tool for therapy.

Understanding of horticultural therapy can be changed in the state through more communication and education of practitioners such as recreational therapists, nurses, master gardeners, etc. of the effects of plants and horticulture on human well-being and improved life-quality. Relf et al. (2004) stated the need to increase the public awareness of plants on the psychological, sociological, physiological, economic, and environmental effects of plants on people.

Objective 2. Determine the prevalence of horticultural therapy programs in Tennessee.

To determine the prevalence of horticultural therapy programs in Tennessee the following question was asked: Does your institution have a horticultural therapy program? From the participants' responses (n=198), 12 institutions were identified in Tennessee as having horticultural therapy programs (6.1% of the 198 completing the survey).

Objective 3. Determine what type of institutions are involved with horticultural therapy, the clientele served, and the activities offered in these programs.

To determine what type of horticultural therapy programs were in prevalence in Tennessee, several different questions were formulated to achieve this objective. They were as follow:

- **How would you describe your institution?**

The 12 horticultural therapy programs were distributed in the following institutions: two programs were in assisted living facilities, one program in a nursing home, one program in a hospital, and eight programs in what was listed on the survey as "Other Institution Type." These eight programs were in the following institutions: one at a botanic garden, one program at a CCRC institution (which is a nursing home, assisted living, and independent living together), one program at a community provider, one program at a park, one program at a technical school, and three programs considered themselves as not applicable (Table 2).

Table 2. Prevalence of horticultural therapy programs in Tennessee.

Institution type	n	%
Assisted Living Facility	2	16.7
Nursing Home	1	8.3
Hospital	1	8.3
Other	8	66.7
Total	12	100.0

Table 3. Length of time of operation of horticulture therapy programs.

Program age	n	%
Less than 1 year	1	8.3
1 to 5 years	5	41.7
6 to 10 years	1	8.3
More than 10 years	5	41.7
Total	12	100.0

- **How long has your horticultural therapy program been in operation?**

For the 12 established programs, only one program can be called new because it had been operation less than one year, five programs had been in operation between one and five years, one program had been in operation between six and ten years, and five programs had been in operation more than ten years (Table 3).

- **What are the demographic characteristics of the clients served?**

The largest client group served by the horticultural therapy programs was the "Over 50 years-old" client group. Ten of the 12 horticultural therapy programs in Tennessee worked with clients in this age group (Table 4). At the same time, most programs worked with more than one age group of clients. It was also found that the 65% of the clients served in these 12 programs were females and 35% were males.

- **What kinds of activities are offered in horticultural therapy programs?**

The growing of annual plants was the most common horticultural activity with 83% of the 12 horticultural therapy programs conducting the practice (Table 5). The second most

Table 4. Client age groups for horticultural therapy programs.

Age group	Programs	
	n	%
20 years old or younger	4	33.3
21 to 30 years old	5	41.7
31 to 40 years old	5	41.7
41 to 50 years old	6	50.0
Over 50 years old	10	83.3

n=12

Table 5. Activities conducted by programs.

Activity	Programs	
	n	%
Grounds annuals	10	83.3
Growing perennials	9	75.0
Growing flowers	9	75.0
Growing herbs	8	66.7
Flower arrangement	5	41.7
Grounds management	4	33.3
Greenhouse production	4	33.3
Other (Please specify)	4	33.3

n=12

common activity was growing perennials and flowers (75%). The third most common activity was growing herbs (67%), and the fourth was making flower arrangements (42%). The remaining 33% of the activities were considered "Other," including the following: garden for food, landscape design, propagating, repotting, and horticultural related crafts. As can be seen in Table 5, all the programs used a variety of horticultural activities.

- **What are the main purposes of your horticultural therapy program?**

The most common use reported for horticultural therapy programs was to "improve mood" of their clients, followed by "social interaction," "stress reduction" and "motor skill development" (Table 6). Horticultural therapy program was least often used for "pain relief" (25%).

These results were similar to results of studies of horticultural therapy for older individuals (Park et al., 2000) and for elder people in sanitarium (Kim et al., 2001), both which showed decreased mental depression and improved life satisfaction through the use of horticultural therapy programs. Heliker et al. (2000) reported significant

Table 6. Horticultural therapy program purpose.

	Programs	
	n	%
Improve mood	8	66.7
Social interaction	7	58.3
Stress reduction	6	50.0
Motor skill development	6	50.0
Other	6	50.0
Improve flexibility	5	41.7
Pain relief	3	25.0

n=12

improvements in psychological well-being associated among elders who participated in a structured three-month gardening project.

- **What are your client's major disabilities?**

Many of the horticultural therapy programs served more than one type of disability. Eight of the 12 programs (67%) served the elderly and clients with physical disabilities. Six of the12 programs (50%) served clients with developmental disabilities and five programs (42%) served clients with visual disabilities. Three programs (25%) served clients who were emotionally or mentally-ill, and three programs (25%) served clients with hearing disabilities (Table 7). Thus, these horticultural therapy programs served clients with multiple disabilities groups. Clients with cultural disadvantages, injury of the spine, and substance abusers were not typically served by these programs. Two institutions specified that their programs worked with clients with Alzheimer's.

Table 7. Major disabilities attended by horticultural therapy programs.

	Programs	
Disability	n	%
Developmental disability	6	50.0
Emotionally or mentally ill	3	25.0
Physical disability	8	66.7
Visual disability	5	41.7
Hearing disability	3	25.0
Elderly	8	66.7
Culturally disadvantaged	1	8.3
Injury of the spine	1	8.3
Substance abuser	1	8.3
Other (Please specify)	3	25.0

Table 8. The length of time that clients spent in the program.

	Programs	
Time	n	%
Less than 1 month	1	12.5
1 to 3 months	3	37.5
4 to 6 months	2	25.0
7 months to 1 year	1	12.5
More than 1 year	1	12.5
Total	12	100.0

- **What is the average length of time spent by a client in your horticultural therapy program?**

In three programs, their clients spend between one and three months; in two of the programs, their clients spend between four and six months. In the remaining three programs, the time that their clients spend in the programs varied. Four of the 12 respondents for horticultural therapy programs did not know how long their clients spend in their programs (Table 8).

- **Do you use volunteers in your horticultural therapy program?**

Seven out of the 12 horticultural therapy programs (58%) used volunteers in their programs (Table 9). The number of volunteers in each program varied from two to four.

- **What is the approximate annual budget for your horticultural therapy program?**

Forty two percent of the horticultural therapy programs (five of the 12) had very low budgets, less than $1,000 (Table 10). Four had budgets had between $1,000 and

Table 9. Use of volunteers by horticultural therapy programs.

	Programs	
Volunteers	n	%
Yes	7	58.3
No	5	41.7
Total	12	100.0

Table 10. Horticultural therapy budgets.

	Programs	
Budgets	n	%)
Less than $1,000	5	42
$1,000 to $4,999	4	33
Unknown	3	25
Total	12	100.0

$5,000. Respondents for the remaining three programs did not know the amount of the budget.

- **Is your program linked to any of other program?**

Fifty-eight percent of the programs (7) were not linked to another type of program (Table 11). Three of the programs (25%) were linked to therapeutic recreation. Two programs (17%) were linked with physical therapy, and the other two (17%) linked with art therapy. Only one program was linked with occupational and music therapies.

Table 11. Horticultural therapy programs linked with other therapies.

Therapies	Programs	
	n	%
Not linked to another program	7	58.3%
Therapeutic recreation	3	25.0%
Physical therapy	2	16.7%
Art therapy	2	16.7%
Occupational therapy	1	8.3%
Music therapy	1	8.3%

n=12

Objective # 4. Determine the awareness and prevalence of therapeutic horticulture in Tennessee.

For the 198 completed surveys, 31 (17%) indicated the use of therapeutic horticulture. There was more use of therapeutic horticulture within the institutions than horticultural therapy. Most of these institutions used outdoor gardens as a tool to improve the well-being of their clients, following with the use of indoor gardening. Some of them also grow herbs, vegetables, and make flower arrangements.

Objective # 5. Determine the need to train certified therapists by The University of Tennessee.

To determine the need to train certified therapists, the following question was asked: To what extent is there a need for professional horticultural therapy training in Tennessee? The mean value was 3.68 for the 198 respondents, meaning here was a need for professional horticultural training in Tennessee (Table 12). Thirty percent thought

Table 12. Participants' responses for need of horticultural therapy training and state association.

	HT Training		State HT Association	
Responses	**n**	**%**	**n**	**%**
(1) No need at all	6	3.0	10	5.1
(2)	12	6.1	18	9.1
(3) Some need	81	40.9	94	47.5
(4)	39	19.7	20	10.1
(5) High need	60	30.3	56	28.3
Total	198	100.0	198	100.0

there was a high need and 81% thought there was some need or greater. Only 9.0% of respondents felt there was no need for training.

This can be a very good opportunity for the University of Tennessee because a major issue in horticultural therapy professional advancement is the lack of colleges and universities that offer academic training in horticultural therapy (Stober, 1994).

To the question of: “To what extent is there a need for a professional horticultural therapy association in Tennessee,” the mean response value was 3.47, meaning there was “somewhat a need for a professional organization in the state (Table 12). Focusing on those that said that there was some need-to high need, it can be inferred that 86% of the respondents perceived the need for an association in the state. Only 14.0% of the respondents felt there was no need for an association in Tennessee.

Objective # 6. Determine the need to compile a directory that will be available to those institutions upon their request.

Seventy-eight percent of 198 respondents indicated they wanted to receive the results of the survey. However, only 30% of those people were interested in being part of a directory.

Summary and Recommendations

The estimated population for this web survey was approximately 1,314 participants, from members of the Tennessee Association of Homes and Services for the Aging, of the Tennessee Hospital Association, and of the Master Gardener Program Listserv.

The results of the survey indicated that people in Tennessee were in general "a little to somewhat familiar" with the use of horticulture as a tool for therapy. Ninety one percent of the respondents felt the need for training in horticultural therapy. There is also interest and need for the establishment of a state professional horticultural therapy association in Tennessee.

The results of the survey also indicated that there were at least 12 horticultural therapy programs in Tennessee. The study showed that each horticultural therapy program was individualized depending on the type of client served, the type of funding of the institution, and therefore, the resources available for the horticultural therapy program. The survey found that the main purpose of the horticultural therapy programs in Tennessee was to "improve mood" of their clients, followed by "social interaction," "stress reduction" and "motor skill development."

These results indicate there is a need and opportunity for the Plant Science Department at The University of Tennessee to lead in the education of the public and Master Gardeners about horticultural therapy, as well as train professionals in the healthcare and social worker fields.

It can be perceived from the commentaries from the web-survey respondents (Appendix B) that most of the people were aware of the benefits of horticultural therapy and therapeutic horticulture because of their own gardening and their perceived effects of plants on themselves, on family members, and on clients.

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CHAPTER III

DESIGNING A ROOF TOP HORTICULTURAL THERAPY GARDEN FOR A GERIATRIC BEHAVIOR CENTER

Abstract

A new building was built at Parkwest Medical Center, Knoxville, Tennessee. with a Senior Behavior Center on the top floor. The Senoir Behavior Center was built with controlled access to care for geriatric patients (often with psychiatric problems) for stays of five to ten days while recovering. An adjoining section of the roof was built essentially as an outdoor room with adequately supported floor, sloping to a water drain in the center of the area. The room was 7.9 m long by 5.5 m wide with 5.2 m tall aluminum panel covered side walls and the top open to weather. A door connected the garden to the Center and an outside wall contained a large exterior window. The objective was to develop a multi-use garden where patients might receive individual and/or group recreational and horticultural therapy and as a restive-healing garden for patients and staff. The garden was designed with raised decking floor composed of removal sections of Bison Ipê Wood Tiles (61 cm by 61 cm).The deck flooring could be leveled by Bison adjustable supports. An arbor covered ramp was designed to facilitate entrance into the garden. GreenTech® modular plant beds (1.2 m by 1.2 m by 22 cm depth), supported to a height of 0.6 m. were designed along of walls. The ramp and seating benches were designed to meet wheelchair accessibility requirements. Plant trellises and hanging pots were placed along long walls to enhance the outdoor ambience of the garden. The beds were designed with native plants selected for sensory stimulation. The garden was designed with a pond-less waterfall for sight and sound stimulation. Multiple level tri-angular shade fabrics were used overhead for shade and reduction of the apparent height of the outdoor room.

Introduction

Therapeutic gardens are especially designed to reduce stress by presenting opportunities to exercise and encouraging safe social interaction exposing patients to familiar nature-like settings (Cooper-Marcus and Barnes, 1995; Ulrich, 1999). In healthcare settings, the therapeutic gardens are designed to benefit a specific population such as psychiatric patients, children's hospital, burning center, etc. For patients suffering from Alzheimer's disease and other forms of dementia, gardens have been designed that provide a safe and stimulating environment. Sensory stimulation associated with gardens and gardening has been used to provoke memories in reminiscence therapy.

A new building was built at Parkwest Medical Center, Knoxville, Tenn. with the Riverstone Senior Behavioral Center on the top floor. The behavior center was built with controlled access to provide advanced level of care for older psychiatric patients for stays of five to ten days while recovering. The maximum number of patients on any given time in this unit was 16 patients. The team of professionals working in this area included physical therapist, occupational therapist, recreational therapist, social worker, dietician, nurses, wound care nurse, pharmacy, Chaplain, and pet therapist.

An adjoining section of the roof was built essentially as an outdoor space with adequately supported floor for future development as a rooftop garden. The center needed assistance in planning the development of the garden.

Literature Review

Healing gardens can be used in various situations, such as part of hospital grounds, a garden park that is open to everyone to enjoy, or a courtyard roof garden. In recent years, the interest in therapeutic garden design has increased, and research has shown that such gardens can in fact have positive effects for patients, staff, and family members, reducing stress and speeding physical and emotional healing. Titled "therapeutic," "restorative," and/or "healing gardens", these designed spaces are intended to function as a complementary therapy within conventional western medicine protocols (Westphal, 2000). Numerous books and articles have been printed on the subject of healing gardens (Warner S.B. Jr., 1991; Cooper-Marcus and Barnes, 1995; Ulrich, 1999; Westphal, 2000). These examples are evidence of the interest of this new trend in the United States.

Dr. Joanne Westphal (1997) defined Therapeutic Garden Design as "the creation of three dimensional spaces (interior and exterior) to facilitate standard treatment protocols and therapy, improve specific therapeutic outcomes for a given patient population. In the cases where the projected patient group has a terminal illness, then the provision of space for meaningful activities, including reconciliation and/or reflection, may be the most appropriate design solution."

The restorative potential of environments was defined by Kaplan and Kaplan (1989) through four components; compatibility, extent, being away, and fascination. "Compatibility" is the degree of fit of the environment to its purpose for the individual. "Extent" is the special configuration and visual limits of the environment. "Being away"

is the feelings of detachment from current thoughts, either real or imagined, that an environment generates for the individual. “Fascination” is the interest and mystery that is afforded sensually to the individual by the environment. The level to which these four components are satisfied in a particular environment determines its restorative potential. A restorative environment provides the benefits of mental clarity, and gives the patient the chance to face issues, reflect on one’s life, and permit the recovery of directed attention.

Therapeutic gardens can be created to promote well-being in non-healthcare settings; they may also be created in parks, schools, and residences. But, therapeutic gardens are essential to the purposes of hospitals, nursing homes, Alzheimer’s care facilities, and other medical environments. Gardens have been studied and have proven to be effective in assisting persons to relax, to be distracted from negative stimuli, and to generate positive thoughts, thereby improving mood (Ulrich et al., 1991; Kaplan, 1995). Therapeutic gardens are especially designed to reduce stress by presenting opportunities for exercise, encouraging social interaction, and providing exposure to familiar nature. Gardens in healthcare facilities may increase social activity since they are places to be visited in the company of other people (Cooper-Marcus and Barnes, 1995), and they provide safe places for social interaction (Ulrich, 1999).

A critical point for garden inclusion in patient-centered-care hospitals was reached in 1984 with the significant study by Roger Ulrich. He found views to nature had a positive influence on health outcomes. He found that patients recovering from gall bladder surgery who had views of trees had fewer post-surgery complications, required fewer doses of strong pain drugs, and went home sooner than those patients looking out

at a brick wall. This was credible scientific evidence that nature has healing properties. According to Roger Ulrich, "Patients, visitors, and staff in healthcare facilities doubtless derive benefits from quite different types of experiences with gardens, including: active experiences such as physical rehabilitation and horticultural therapy; less physically active modes such as sitting and talking; and physically passive contacts such as looking at the garden through a window (Ulrich,1999)."

With this brief overview of hospital design, one can see that the role of gardens and open space has evolved as the concept of hospitals has evolved. Depending on the particular period, garden areas served to facilitate patients in dreams, waking, exercise, and repayment of debt; they also served as important sources of food, fiber, and medicine.

Benefits of Gardens for Alzheimer's patients and other dementias

According to the Alzheimer's society (Alzheimer's Disease International, 2007), there are more than 18 million people with dementia in the world today. Age is the greatest risk factor; about 5% of people over the age of 65 will develop dementia and about 20% over 80. Life expectancy is increasing worldwide and over the next 15 years the numbers of people with dementia will double.

One specific area of mental health in which therapeutic horticulture is expanding is the care and treatment of patients suffering from Alzheimer's disease and other forms of dementia. Gardens have been designed that provide a safe and stimulating environment for patients. Rachel Kaplan's (1973) research over thirty years ago showed that gardening activities may enhance the cognitive processing due to the high level of

cognitive processing needed for planting flowers. Maxine Kaplan (1994) presented a quantitative research study that demonstrated that horticultural therapy treatment of institutionalized elderly persons with Alzheimer's disease can reduce periods of agitation and aggression through the use of sensory stimulation in a garden setting. This study demonstrated that sensory stimulation can also increase awareness of self and environment.

The sensory stimulation associated with gardens and gardening has been used in reminiscence therapy. Under appropriate conditions people are reminded of, and recollect events from their past. It involves the discussion of past activities, events and experiences with another person or group of people with the aid of plants or gardening activities as cues. For older people, the garden may be an important source of memory cues (Jackson, 2005).

Based on studies in environmental psychology, physical education, and geriatrics, it can be hypothesized that experiences from garden environments may affect depression positively by reducing stress, fostering exercise, enhancing emotional and psychological well-being, and providing access to social support (Rappe and Kivelä, 2005). In healthcare facilities, gardens offer a possibility for temporary escape and contribute to a sense of control, thus decreasing stress levels (Cooper-Marcus and Barnes, 1995).

Psychiatric patients benefit from working with plants, from growing things. People with chronic illness often experience confusion and the inability to enjoy life even when the disease may be in remission. They may lack socialization skills, or need assistance to interact comfortably or appropriately with others. Where they have often failed to establish satisfying interpersonal relationships with others, they find working

with plants less demanding and less threatening than working with people and a relief from stress, as they restore health with the help of psychotherapy (Westphal, 2000).

When working with seniors with dementia, Camp (1999) found that careful selection of purposeful, modifiable activities results in higher levels of engagement and positive effect among participants. Utilizing horticultural therapy activities with seniors with dementia can provide rewarding experiences when activities are carefully planned to maximize success by decreasing the demands placed on the participant and minimize the risks associated with participation (Gigliotti et al., 2004).

Occupational therapists who work with patients with late stage dementia often experience that sensory stimulation is very beneficial for those patients (Allen et al., 1995). Jackson (2005) stated that of the ways in which a garden or natural environment can provide sensory cues for memory recall that their use will become more significant in psychiatric-geriatric institutions.

It is also possible regular participation in gardening may offer some protection against the development of dementia. In a prospective study of over 2000 older people living in Gironde area of France, Fabrigoule et al. (1995) showed that those who gardened, traveled or carried out odd jobs or knitting were significantly less likely to develop dementia than those who did not.

Given the growth of the elderly population, those people with Alzheimer's disease and other dementias, and the need for creative interventions, clinical research related to horticultural therapy and gardens specifically designed for this population is necessary.

Design suggestions for psychiatric hospital gardens

When designing a “healing” or “therapeutic” garden, there is need to research what is relevant to everyone affected by the garden space. The primary goal in designing a therapeutic garden is the use or recognition of the healing elements in that space, as well as the space itself. Designing healing or therapeutic gardens would help create a space for the users to develop inner tranquility and have a place designed just for them. The entire design process should be done with the collaboration of the psychiatrist and other healthcare providers.

Safety issues are central to good garden design for people with Alzheimer’s or dementia. Each site and application is unique and some of the following suggestions may not be appropriate or applicable. There are several considerations to take into account in the design process (Alzheimer’s Garden Planning, 2007; Sachs, 2005; Sulis, 2006):

- Pathways need to have a smooth surface and low in glare.
- Paths at their intersections should have a five-foot minimum width to accommodate the turning radius of a wheelchair.
- The slope of a walk must not exceed 5%.
- Only materials that can withstand abuse over time should be used.
- Only materials that may not be used to harm anyone or themselves should be used.
- Easy access from the indoors to the outdoors for patients, visitors, and staff should be provided.
- Focal points should be provided to help people orient themselves in the garden.

- Plants that are poisonous, toxic, or irritating to the touch should be avoided.
- A variety of spaces and experiences should be provided.
- The layout of the garden should be easily “readable” for the user.
- A planting buffer should be placed between people in the garden and any windows looking out onto the garden to avoid a “fish bowl” effect.
- A water feature should be created to enhance quality of space.
- Some form of protection from the sun should be provided.
- The design should avoid too much light reflection, and shadowy areas.

Materials and Methods

Design Goals for the Horticultural Therapy Garden

The objectives of this project were to develop a multi-use rooftop garden as a restive-healing garden for patients and staff providing feelings of security in a home-like deck environment 1) where patients might receive individual and/or group recreational therapy, physical therapy, or horticultural therapy, 2) provide opportunities to relieve tension, frustration and aggression, 3) provide opportunities for reflection, relaxation and privacy for staff and patients, 4) provide opportunities for different social and recreational activities, and 5) provide stimulation of the senses with color, smells, different textures (touch), and sounds.

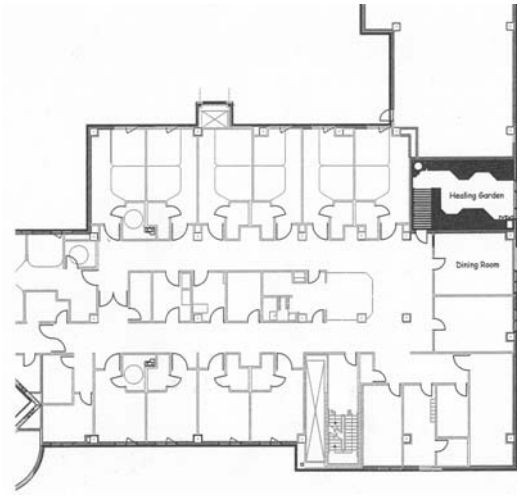

Figure 1. Floor plan of Senior Behavioral Center.

(The potential courtyard area is shaded).

Characteristics of the Site

The Riverstone Senior Behavioral Center is located on the top floor. The center was built with a controlled access to provide an advanced level of care for older psychiatric patients (Fig. 1). An adjoining section of the roof was built essentially as an outdoor space (room) with adequately supported floor for future development as a rooftop garden. The space had an North/South orientation axis with the entrance in the northwest corner, and the window facing south (Fig.1 and Fig.2).The outdoor room had a rubber mat covered floor sloping to a water drain in the center of the area. The room was 7.9 m long by 5.5 m wide with 5.2 m tall aluminum panel covered side walls and the top open to weather. These walls were painted with a white color that produced too much reflection of light (Fig.2 and Fig.3).. A door connected the garden to the Center with a threshold height of 38 cm, which made it very difficult for patient's transit using wheelchairs or even to step over. An outside wall contained a large exterior window.

Figure 2. Floor view of courtyard space with entrance door.

Figure 3. Aerial view of courtyard space showing open top and window

Electrical outlets were already provided to the outdoor space. Water connections were not present in the room.

Horticultural Therapy Garden

Several concepts were developed to find the best use for this small space (Fig. 4). The healing courtyard was designed as a home-like deck space which would function as a healing or restorative wellness courtyard for patients to wander through, sit in, to visit with family, etc; and for the use by staff as well (Fig. 5). The design had planting beds with sitting benches where patients would receive horticultural therapy by interacting with plants through planting, transplanting, and for the stimulation of their senses in many ways, for exercise, and for a social setting in a more natural environment. The courtyard was designed with an active area in the middle where recreational therapy activities and group horticultural therapy sessions may take place at different times of the day. It would also have a more passive area towards the end, or near the window.

The garden was designed with a raised decking floor (for leveling and water drainage) composed of removal sections of Bison Ipê Wood Tiles (Bison Deck Supports- a United Construction Products, Inc., Denver, Colorado) (61 cm by 61 cm) (Fig. 6). The tiles are lightweight, extremely durable, and easy to remove. The deck flooring could be leveled by Bison adjustable supports that can be laid on rooftops without attachments (Fig. 6). These would allow leveling of the deck much easier without modification of the existing rubber mat. The use of this type of tiles permits drainage of water under the deck to the main drainage in the center of the courtyard with no necessity of installation of drainage pipes (Fig. 7).

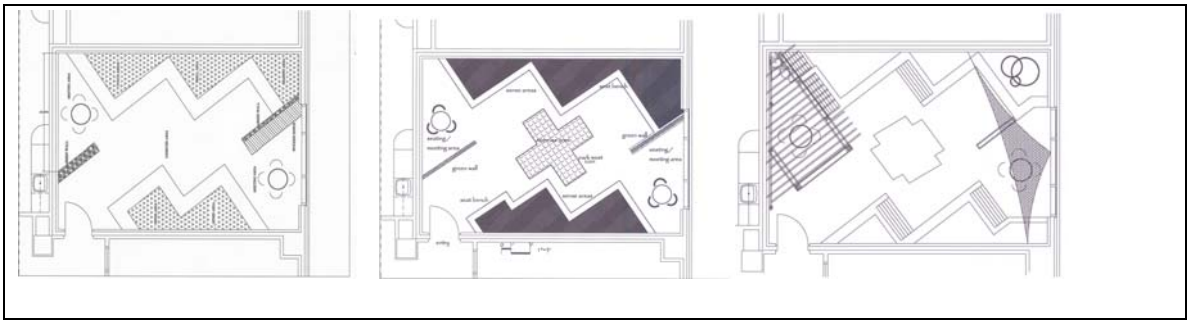

Figure 4. Three initial design concepts.

Figure 5. Healing Courtyard Garden final design.

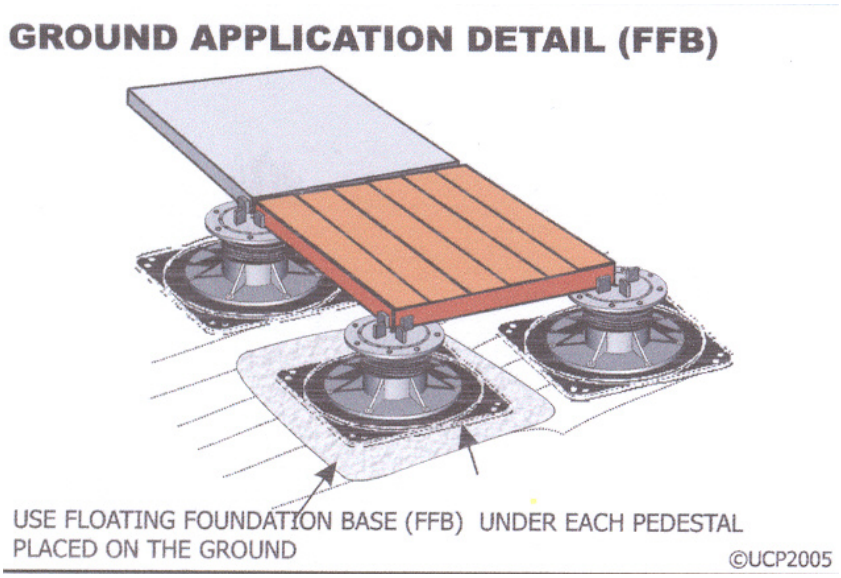

Figure 6. Bison Ipê Wood tiles and adjustable supports for

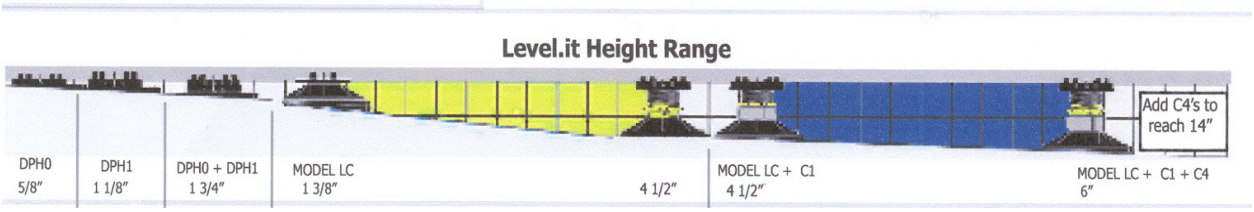

Figure 7. Leveling Wood Tiles with Bison supports (www.BisonDeckSupports.com).

The entrance door to the courtyard was changed to include a window for the patients and staff to view the courtyard. The threshold of the entrance door was too high (38 cm) to readily step over and it should be eliminated. The opening of the door should open to the indoors of the Senior Behavioral Center. An arbor covered ramp with a 5% slope, and 1.52 m width for wheelchair accessibility was designed to facilitate entrance into the courtyard (Fig. 8).

The faces of coverage of beds, seating walls, arbor, and green wall trellises should utilize Trex® material, which is made of recycled wood and plastic, for improved durability. The plastic in Trex® boards reduces insect damage, rotting and splintering of the boards, thus reducing potential injury to patients.

For the individual with Alzheimer's disease or other dementias, the walled or fenced space serves a refuge. This courtyard had walls, but the height and appearance of them needed to be made less threatening. The use of trellises and hanging pots to cover the longest two walls make the space less threatening and create the feeling of being outdoors in a garden ("Green Walls") (Fig. 9 and Fig. 10). To shorten the height of the two shorter walls, an Virginia Creeper covered arbor was designed at the entrance and multiple level tri-angular shade fabrics used above the opposite wall (Fig. 11). These would reduce the apparent height of the outdoor room, as well reducing light reflection and extending the plant canopy vertically, and all these will also give a different character to the space using different heights and colors.

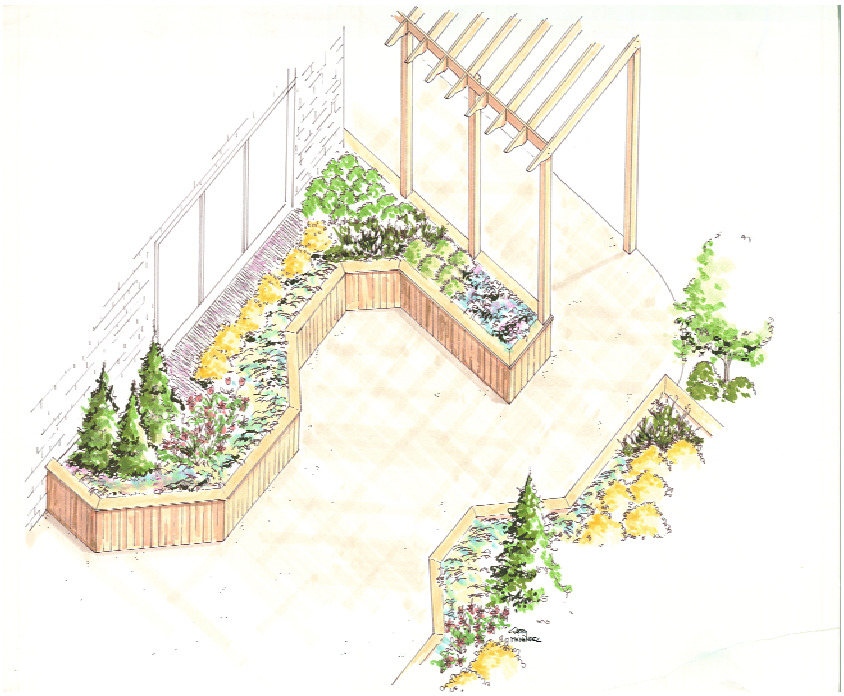

Figure 8. Isometric entrance into courtyard with arbor covered ramp.

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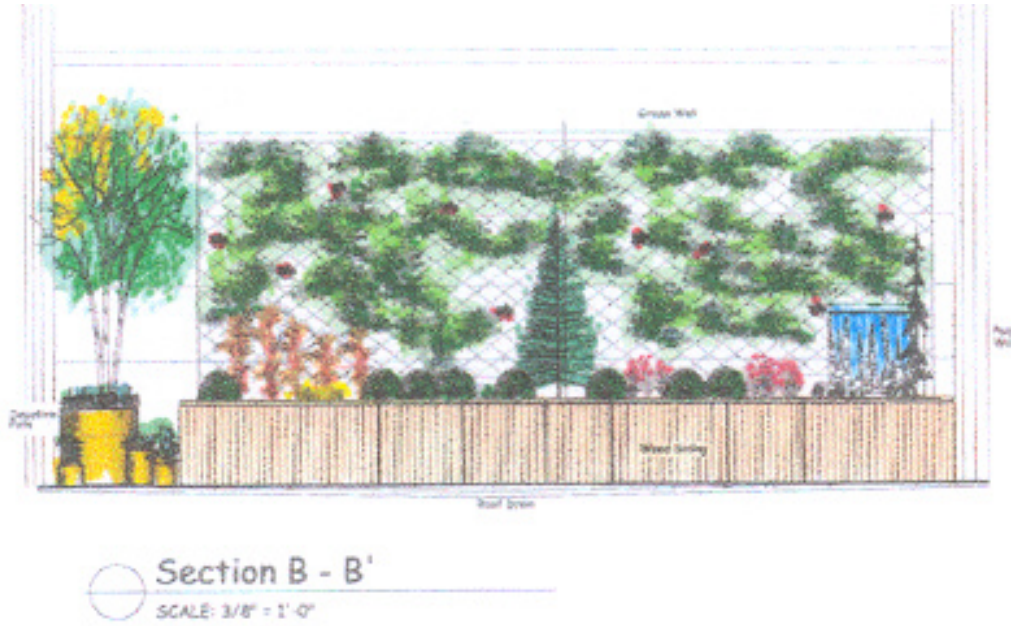

Figure 9. Plant trellises (Green Walls) on cross elevation of wall opposite

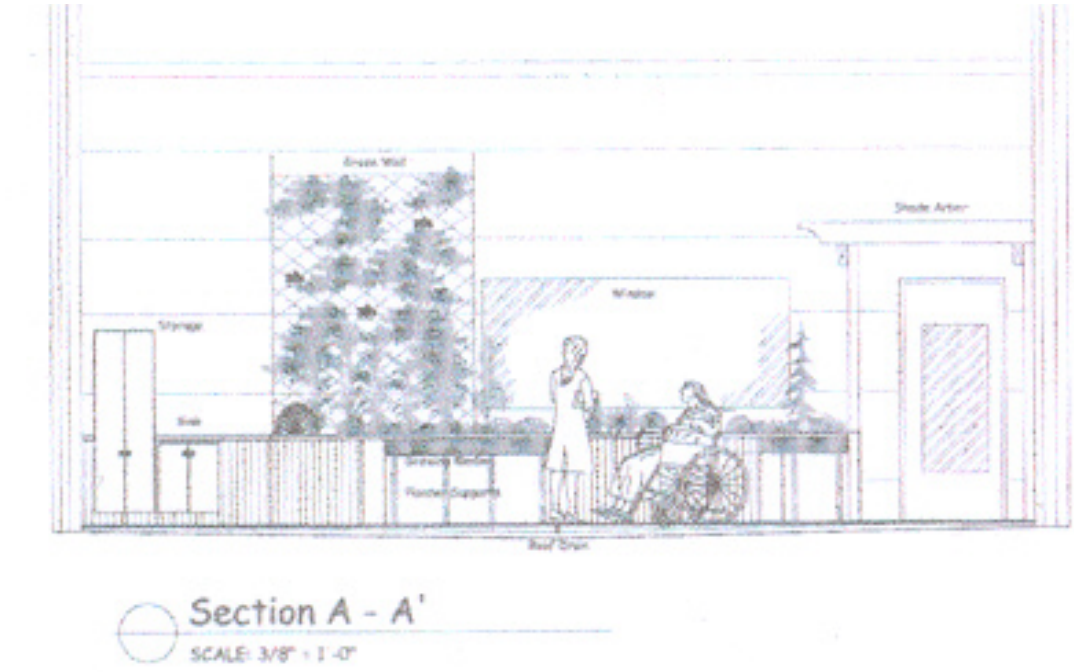

Figure 10. Plant trellises (Green Walls) on cross elevation of back wall (with door).

Figure 11. Shade Fabrics or Sails (www.shadezones.com).

Figure 12. Pond-less Waterfall example (www.earthinspiredproducts.com).

The garden was designed with a pond-less waterfall (stone wall waterfall dumping into pebbles surrounded by ferns). The pond was designed in a corner planting bed at a height of 76 cm. The pond was set in a corner out of reach of the patients to discourage the throwing of pebbles and urinating in the waterfall. This water feature was placed diagonal to the entrance as a focal point and to provide visual and sound stimulation, thus as stimulate feeling of peacefulness (Fig. 12).

The plant beds were created with (1.2 m by 1.2 m by 22 cm depth) modular plant bed containers from the Green Roof Top Garden Systems (Green Tech®, Roswell, GA), supported to a height of 0.6 m (Fig. 13). These self contained units allow project flexibility setting back the beds away from walls for better use of the restrained space by the psychiatric patients, and for better drainage of the beds. Using these modular units will reduce weight because they eliminate the use of gravel drainage medium typical of traditional intensive gardens. Also, if there is a leak in the roof membrane, modules can be easily removed and replaced later after the leak is fixed. Bench-planters (Fig. 14) were designed with 61 cm heights to meet wheelchair accessibility requirements.

Figure 13. Modular Plastic Squares (GreenTech®, www.greentechitm.com)

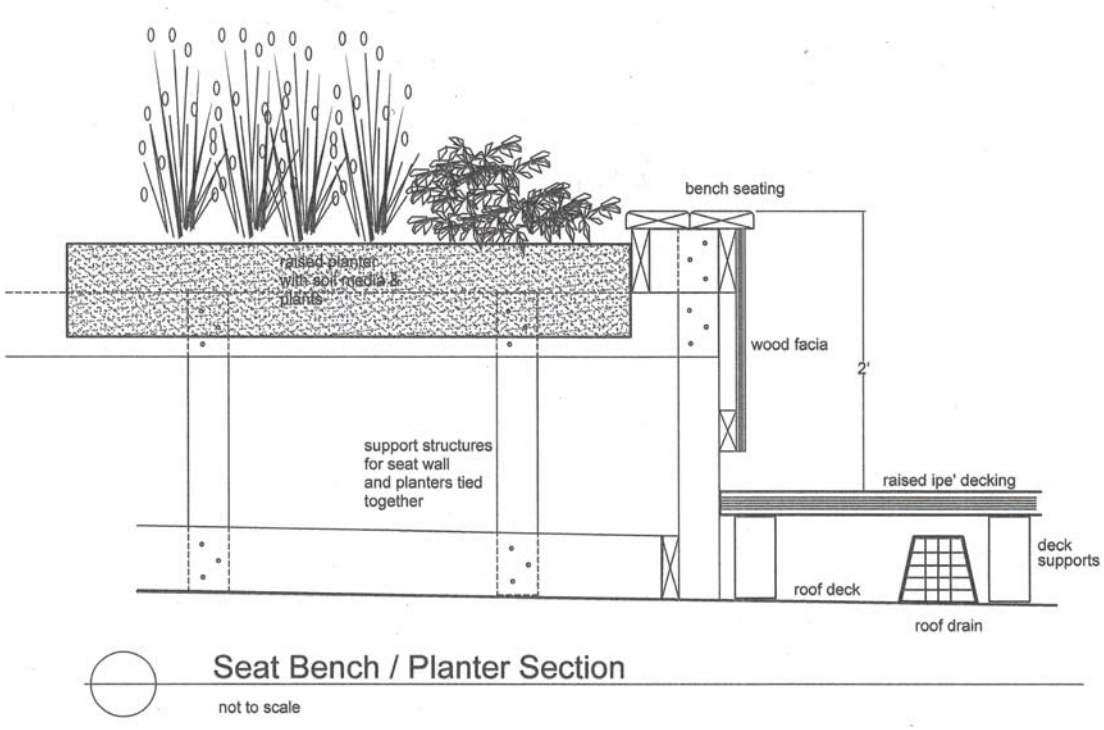

Figure 14. Detailed section of seat bench/ planter bed.

An open space in the center was designed for the different therapies to take place, meetings, etc (Fig. 15 and Fig. 16). A cabinet for storage and a work sink with more storage cabinets underneath was placed at the corner of wall containing the exterior window and the wall containing the door. A permanent round table, which would have multiple uses as horticultural therapy, other individual therapies, staff meetings, etc. was placed beside the window.

Examples of plant material that may be used in the beds for the patients were chosen for sensory vision, smell, or touch stimulation (Table 12). Some of the plants can provide more than one type of sensory stimulation. More plants to use with geriatric patients are listed in Appendix-C. Approximately 90% of the plants chosen are native plants with the assumption that those may have been more familiar during the patient's younger life. The chimes and water fountain stimulate sound, and vision.

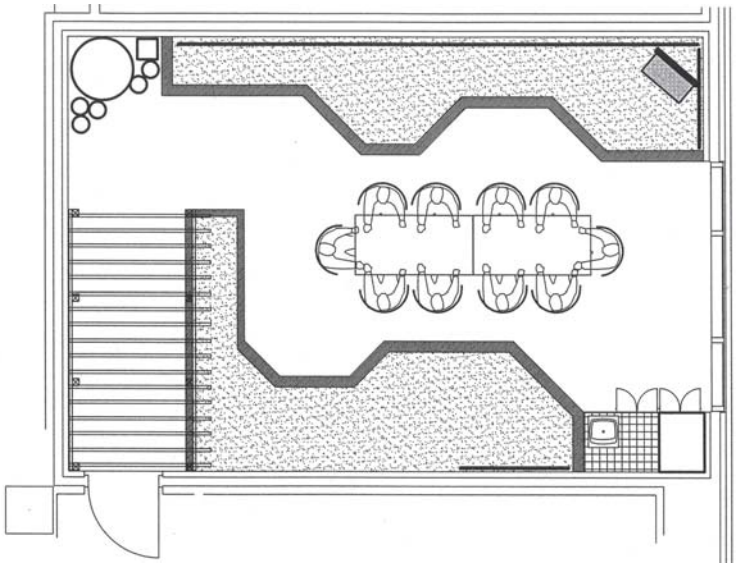

Figure 15. Seating arrangement of Healing Courtyard Garden for group recreational therapy session.

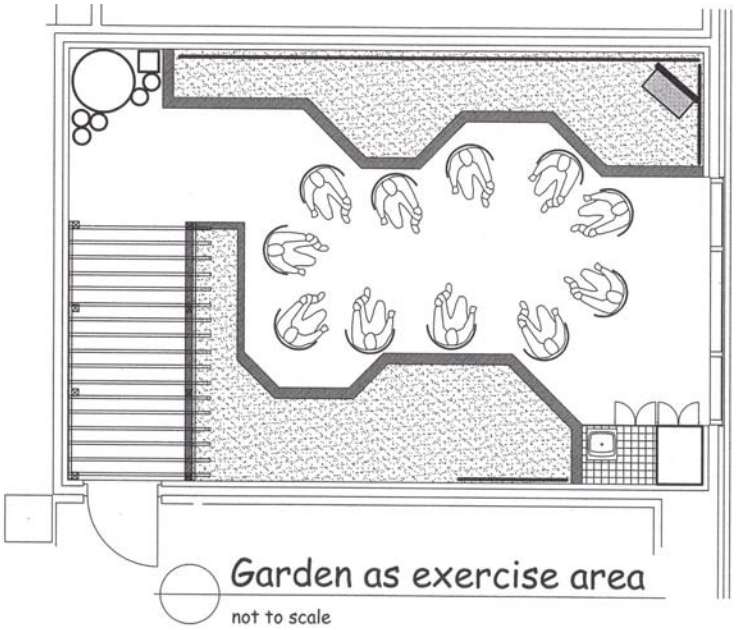

Figure 16. Seating arrangement of Healing Courtyard Garden for group horticultural therapy session.

Table 13. Examples of plants for sensory stimulation.

Sense to Stimulate	Common Name	Scientific Name	Life Cycle
Vision	Coleus	*Solenostemon scutellaroides*	Annual
Vision	Blazing Star	*Liatris sp.*	Perennial
Smell	Marigold	*Tagetes sps.*	Annual
Smell	Herbs	*Many Species*	Annuals
Smell	Moonflower	*Ipomoea alba*	Annual
Touch	Lamb's ear	*Stachys byzantina*	Perennial
Touch	Creeping Thyme	*Thymus serphyllum*	Annual
Touch	Coral Bells	*Heuchera sanguinea*	Perennial
Taste	Herbs	*Many species*	Annual
Taste	Strawberries	*Fargaria ananassa*	Annual
Taste	Lavender	*Lavandula angustifolia*	Annual
Sound	Water fountain		
Sound	Chimes		

Future considerations

If temperatures become too high in the summer or sunlight still glares too much in the courtyard, then a 30%-50% shade cloth can be stretched across the top of the courtyard.

Use of the courtyard will be limited by rainfall and cold weather in the winter. Some type of cover can be placed above the courtyard to exclude rain or to maintain warmer temperatures in the winter. Probably the simplest method would be similar to plastic-covered greenhouses with aluminum support structures placed over the courtyard. Some of those types of greenhouses have small electric motors that pull the plastic over the greenhouse top to keep rain out or heat in, and pulled back to let heat escape.

Summary

The design of the Rooftop Horticultural Therapy Garden provides the following:

1. A restive-healing garden for patients and staff that promotes feelings of security and safety in a home-like deck environment.
2. Space for patients to receive individual and/or group recreational, physical, and horticultural therapies.
3. Plants that stimulates the senses with different colors, smells, textures (touch), and sounds.
4. An outdoor space that provides opportunities to relieve tension, frustration and aggression, and also opportunities for reflection, relaxation and privacy for staff and patients.

5. The outdoor space provides opportunities for different social and recreational activities

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APPENDIXES

Appendix A- Survey Instruments

Appendix A-1.
Web Survey Questionnaire of Horticultural Therapy Programs in Tennessee

The University of Tennessee Institute of Agriculture Department of Plant Sciences

Thank you for your participation in our study. This survey is part of my degree requirements at The University of Tennessee. The purposes of this study are to determine the awareness of the use of horticulture as a tool in therapy, to identify the horticultural therapy programs already in existence, and what type of institutions, staff, clientele, and activities are involved in these programs in Tennessee. We assure you all your answers will be kept completely confidential and will not be associated with your name or organization. Answering the survey will constitute your informed consent to participate. We greatly appreciate you taking the few minutes necessary to complete and return your survey.

Gardening is an activity- the art and craft of growing plants like flowers, vegetables, herbs, and fruits- with a goal of creating a beautiful environment and/or food.

Do you have a current interest in gardening?
__ Yes
__ No

How often do you garden?
__ Never
__ Rarely
__ Occasionally
__ Frequently
__ Very frequently

What do you grow in your garden? (Please check all that apply)
__ Annual
__ Perennials
__ Vegetables
__ Fruits
__ Herbs
__ Flowers
__ Other: _____

Are you a member of any gardening related organization?
__ Yes
__ No

Please list the gardening related organizations of which you are a member.
_____
_____
_____
_____

How familiar are you with the use of horticulture as a tool for therapy?
__ Not at all
__ A little
__ Somewhat
__ Familiar
__Very familiar

The following questions concern information about the institution where you are employed.

How would you characterize the ownership of your institution? (Please check all that apply)
__ Non-profit
__ Private
__ State
__ Federal
__ City
__ Other: _____

How would you describe your institution? (Please check all that apply)
__ Assisted Living Facility
__ Nursing Home
__ Hospital
__ Other: _____

How long has your institution been in operation?
__ Less than 1 year
__ 1 to 5 years
__ 6 to 10 years
__ 11 to 15 years
__ More than 15 years

Horticultural Therapy is a structured therapy program that uses plants and plant activities as a therapeutic tool to improve the body, mind and spirit. In a horticultural therapy program, participant goals are identified, results documented, and assessments are made for participant improvement. These programs usually take place in hospitals, rehabilitation settings, nursing homes, etc. *Therapeutic Horticulture* is not a formal therapy program, and it does not require that goals are identified and addressed. The pleasure that comes from being close to plants and natural environments is emphasized for the enjoyment they bring to clients and patients. It is often applied to settings such as courtyards, indoor plants, growing herbs, indoor and outdoor gardening, etc.

Does your institution have a horticultural therapy program?
__Yes
__ No

Do you use therapeutic horticulture at your institution?
__ Yes
__ No

How do you use plants in therapeutic horticulture as a tool to improve the well-being of your clients? (Please check all that apply):
__ Outdoor gardens
__ Growing herbs
__ Growing vegetables
__ Indoor gardening
__ Flower arrangements
__ Other (Please specify): _____

To what extent would you support or oppose having a horticultural therapy program in your institution?
__ Strongly oppose
__ Somewhat oppose
__ Neither support nor oppose
__ Somewhat support
__ Strongly support
__ Don't know

How long has your horticultural therapy program been in operation?
__ Less than 1 year
__ 1 to 5 years
__ 6 to 10 years
__ More than 10 years

What are the main purposes of your horticultural therapy program? (Please check all that apply)
__ Stress reduction
__ Social interaction
__ Pain relief
__ Improve flexibility
__ Motor skill development
__ Improve mood
__ Other: _____

What is the approximate annual budget for your horticultural therapy program?
__ Less than $1,000
__ $1,000 to $4,999
__ $5,000 to $9,999
__ $10,000 to $25,000
__ More than $25,000 (Please list total budget): _____
__ Don't know

What is the number of full-time staff involved in your horticultural therapy program?
__ None
__ 1 person
__ 2 people
__ 3 people
__ 4 or more people (Please list total #): _____

Please list the number of staff by the highest degree each has received:

	Number
High School Diploma / GED	
Vocational/Technical Training	
Associate degree	
College degree	
Post-Graduate degree	

What are the professional backgrounds of your full-time staff involved in your horticultural therapy program? (Please check all that apply).
__ Horticulture/Agriculture
__ Physical Therapy
__ Occupational Therapy

__ Recreational Therapy
__ Social Worker
__ Psychologist
__ Other: _____

How many part-time staff are involved in your horticultural therapy program?
__ None
__ 1 person
__ 2 people
__ 3 people
__ 4 or more people (Please list total #): _____

Please list the number of part-time staff by the highest degree each has received:

	Number
High School Diploma/GED	
Vocational/Technical Training	
Associate Degree	
College Degree	
Post-Graduate Degree	

What are the professional backgrounds of the part-time staff involved in your horticultural therapy program? (Please check all that apply).
__ Horticulture/Agriculture
__ Physical Therapy
__ Occupational Therapy
__ Recreational Therapy
__ Social Worker
__ Psychologist
__ Other (please specify): _____

Do you use volunteers in your horticultural therapy program?
__Yes (Please specify how many): _____
__ No

What is the average length of time spent by a client in your horticultural therapy program?
__ Less than 1 month

__ 1 to 3 months
__ 4 to 6 months
__ 7 months to 1 year
__ More than 1 year
__ Don't know

Which of the following resources are available for your horticultural therapy program? (Please check all that apply).

__ Greenhouse
__ Classroom activities
__ Vegetable garden
__ Flower Garden
__ Herb garden
__ Indoor light stands
__ Other (Please specify): _____

What activities are involved in your horticultural therapy program? (Please check all that apply).

__ Grounds management
__ Growing herbs
__ Growing annuals
__ Growing perennials
__ Growing flowers
__ Greenhouse production
__ Flower arrangement
__ Other (Please specify): _____

Is your program linked to any of the following? (Please check all that apply).

__ Physical therapy
__ Therapeutic recreation
__ Occupational therapy
__ Music therapy
__ Art therapy
__ Not linked to another program
__ Other (Please specify): _____

The following questions are about the demographics of clients served in your horticultural therapy program.

What is the approximate number of clients within each age bracket served annually by your horticultural therapy program?

	None	1 to 10	10 to 25	26 to 50	51 to 75	Over 75
20 years old or younger						
21 to 30 years old						
31 to 40 years old						
41 to 50 years old						
Over 50 years old						

What is the percent distribution of your clients by gender? *Should add up to 100 percent.*

	Percent
Females	
Males	

What are your client's major disabilities? (Please check all that apply).

__ Developmental disability
__ Emotionally or mentally ill
__ Physical disability
__ Visual disability
__ Hearing disability
__ Elderly
__ Culturally disadvantaged
__ Injury of the spine
__ Substance abuser
__ Other (Please specify): _____

Now, I would like to ask your opinion about horticultural therapy in Tennessee in general.

To what extent, is there a need for professional Horticultural Therapy training in Tennessee, if at all.

__ No need at all

__ Some need

__ High need

To what extent, is there a need for a professional Horticultural Therapy association in Tennessee, if at all.

__ No need at all

__ Some need

__ High need

If you have comments you would like to share about Horticultural Therapy in Tennessee, please write them below.

_____

_____

_____

_____

Please click the NEXT button to submit your responses. You will then be taken to the registration page to be eligible to enter into the drawing for two $50.00 gift cards for Home Depot, to receive the results of this survey, and/or to be part of a directory of horticultural therapy programs in Tennessee. All responses on the registration page are optional and voluntary. This registration page is totally separate from the survey questions so your contact information can not be linked to your survey responses in any way.

Would you like to be entered into the drawing for two $50.00 gift cards for Home Depot?

__ Yes
__ No
__ No Answer

Would you like to receive the results of this survey?

__ Yes
__ No
__ No Answer

If the survey results indicate a need to compile a directory of the Horticultural Therapy programs in Tennessee, would you like to be part of this directory?

__ Yes
__ No
__ No Answer

Please enter your contact information, such as your name and email address or phone number. Contact information will be saved in a separate database from your survey responses to ensure that your contact information will not be associated or connected with the survey responses in any way.

Name: _____

Email: _____

Phone: _____

Please click the NEXT button to submit your registration information.

Appendix A-2. E-mail with link to survey

Dear :

We would appreciate your participation in this web survey of horticultural therapy programs in Tennessee. The survey will take less than 15 minutes to complete. By completing this survey you will be entering into a drawing for two $50.00 Home Depot gift cards.

The primary objective of the study is to determine the awareness of horticulture as a tool in therapy, to determine the prevalence of horticultural therapy programs in Tennessee including the settings, staff, and clientele involved in these programs.

This survey is completely voluntary. You can help us very much, however, by taking the few minutes to share your experiences and opinions about horticultural therapy. Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified.

If you have any questions or comments about the study, we would be happy to talk to you. Please contact Jenny Pfeffer, Survey Project Director, by phone at 865-382-1237, or email at jpfeffer@utk.edu.

To begin the survey please click the link bellow
http://survey.utk.edu/mrIWeb/mrIWeb.dll?I.Project=HORTICULTURALTH1

Thank you very much for helping with this important study

Sincerely,

Appendix A-3. Reminder e-mail

Dear :

Last week, you received an e-mail with a link to a survey seeking opinions about horticultural therapy programs in Tennessee.

If you have already completed the survey, please accept our sincere thanks. If not, please do so today. We are especially grateful for your help because it is only by asking people like you that we can determine the prevalence of horticultural therapy programs in Tennessee. This will aid the Department of Plant Sciences at The University of Tennessee in developing courses and/or a concentration in horticultural therapy at the department.

If you did not receive the previous e-mail with link to the survey, here is the link to the survey:

http://survey.utk.edu/mrIWeb/mrIWeb.dll?I.Project=HORTICULTURALTH1

Thank you very much for helping with this important study.

Sincerely,

Appendix B. Web-Survey Comments.

		Frequency
Valid		202
	5 yrs ago I was dx with breast cancer. It may not have been an organized hort. therapy, but being able to touch the earth and build a raised bed helped me to recover and deal with cancer tx	1
	A home garden can be theapeutic. My job is stressful. I help doctoral students in different disciplines design & implement dissertation research & interpret statisical data.) My organic garden is a welcomed relief from the job. Often clients don't come to me until they are at wits end, & may have made mistakes before coming to me. I have to figure out how to help them recover from their mistakes & reach their goals. I can go out in the garden and work while thinking out their research problems. That helps me stress down AND figure out the best thing for them to do. The exercise is helpful too. BTW, if you want an experienced researcher's opinion on your survey: overall, it is well constructed. However, there were several questions that just were not applicable to my situation. You did not either offer an "n/a" option nor did you allow me to leave the question unanswered. This means that several of my answers will lack content validity (the answer will not mean what you think it means.) Good luck...	1
	A professional association of Horticultural Therapists is needed to assure uniform training and professional certification, competence and quality therapy--and prevemt exploitation by poorly prepared opportunists and charlatans.	1
	As a member of Knox Green, we are actively developing a Therapy Garden at the UT Hospital in Knoxville. Gardening is a 'must have' therapy for me each day/365 as a retired person.	1
	Before I moved back to Tennessee I was a member of Gardeners of America and we would help with a memtal institution by doing gardening with some of residents, if we can do this at other places whynot here in Tennessee. Lets get this going here in Tennessee.	1
	Being in touch with plants and the earth is good for everyone.	1
	Contact HT at Arlington Developmental Center, June Spoonamore, for info on Intro to HT being given at Memphis Botanic Gardens in June, 2007.	1
	Covington Rehabilitation and Nursing Home in Tipton County has established a garden for its residents.	1
	Gardening has always been an effective form of relaxation and stress relief for me. I feel it can do the same for others. To be able to add beauty to the world and improve the well-being of others and yourself in the process.....It's a win-win situation.	1
	Gardening is a shared passion with most of the population in this area. Continuing to have the opportunity to do so, whether it be in hospitlas, nursing homes, Senior centers, etc., would make a huge difference in that persons personal healing/daily living.	1
	Gardening is a source of pleasure, stress-release, creativity, routine and organized structure for teaching planning,initiating and achieving goals for better physical and mental health. Gardening promotes patience, organinzation, research and healthy living habits for those who practice even minimal gardening. I involve children of all ages in a program of greenhouse horticulture and plant study. Children need this time outside and in the fresh air with hands on activities that teach as well as occupy their time. I have read about Horicultural programs in prisons which have been beneficial as a tool for the mental and physical restructuring of incarcerated persons. Senior citizens love to occupy their time growing flowers in specially raised beds for those who are unable to garden in a normal way. Everyone could benefit physically and mentally from gardening in one form or another.	1

	Gardening should be fun and not structured as you defined it in Horticultural Therapy. The only goal I can see would be that it would be billable if goals and progress could be documented and I think that would prostitute gardening. I totally agree with the concept as defined in Therapuetic Horticulture.	1
	great research project. I think most people who don't garden at all consider it as additional work - they don't consider the mental and emotional benefits that can be derived from the act of growing plants and enjoying the benefits they provide. You would probably make an excellent speaker for any Master Gardener program and maybe that needs to be added as a teaching module - this could be increase the awarenestt of horticultural therapy to many Tennesseans.	1
	Horticultural Therapy is very important. Just as animal therapy helps the old, the young and inbetween, so can horticultural therapy.	1
	Horticultural Therapy was used in an organization our son attended. The org. was a non-profit program for intellectually and physically challenged adults. It was not as successful as we would have liked but it was not the program but lack of staff training. I would love to see the therapy available in assisted living centers and day centers for persons with disabilities.	1
	Horticultural Therapy would be wonderful in any situation where it helps those with limited abilities. Nature is a wonderful healer.	1
	Humans are connected to the earth in many ways. Soil is only one way. Man is dust and to dust he shall return. When a person gardens correctly, he receives newness and refreshing of life through plants and water. Also renews his Spirit. He might not think of it in this way but it will happon! Beauty for his eye and food for his body. He may become more independent and self relient. Give a person a hand up not a hand out. With the right conditions and knowledge a person can accomplish anything and teach others what he has learned.	1
	I'm not sure what you are looking for in the way of a comment, however, gardening clears my mind and makes me feel happy and calm when I am gardening or just doing a little deadheading. It is my therapy.	1
	I'm retired...your questions have NO bearing on me.	1
	I've never even thought of the concept of Horticultural Therapy, but it is a wonderful idea that would surely have far-reaching benefits.	1
	I am a trained volunteer educator for the National Alliance on Mental Illness-Tennessee and in investigating services available for the mentally ill, I visited the Living and Learning Center in Williamson County and was very impressed with its program.	1
	I am not aware of the Horticultural therapy in Tn. We do flower gardens with our patients and they love taking care of the plants and enjoy watching them grow.	1
	I am unaware of a need.	1
	I became disabled in 1998.I happened upon the article of the Master Gardening program in 2005. I wish this type of information was given;along with all the medicines as the try to figure what is wrong with me from all the doctors I have seen.	1
	I began gardening after beginning antidepressants. Gardening has been a tremendous help to me. However, last summer I began to treat it as a "job" with stress that I was not doing enough, it always was a mess, thinking of all the tasks I had left undone, etc... I lost the joy, as well as the therapudic aspect of gardening.. and it just became a chore. Upon realizing this, I was able to relax and not approach my garden as a drudgery, but to "lighten up"and the joy returned !Why do we have to make everything so complicated? I think once you start adding all those things that you listed in Horticultural Therapy (outlines, objectives) , it would just suck the fun out ... however if your clients (patients, residents, etc) knew nothing of the objectives, then they could just enjoy things and let the project directors worry about all that.... In summary, gardening is WONDERFUL therapy ...	1

	I beleive that the TN Botanical Gardens try to encourage various programs that will benefit its citizens. Education is always the priority. I feel in some areas of the State, the gardens are there and the need is there, but the bridge to link the two together is not.	1
	I believe that a program for people to become involved with gardening before and after retirement would be a great asset for their well being as the age, giving them an interest that they can pursue to give them a feelng of continued importance, that they are not a burden. this should be a broad base not just one nitch such as raising roses, or daylillies etc. if they have the knowledge give them the opportunity to teach others also, keeping them involved.	1
	I employ therapeutic horticulture mostly ona daily basis. I already record in my assessment notes the impact upon self esteem, recovery after the tornado at Paris Landing, changes in behaviors, etc. Should it be rigidly structured it would lose the freedom allowed and be restrictive much as med clinic would be. A program like this should be more flexible in my opinion.	1
	I have been involved with a gardening group which did some garden therapy at a nursing home.	1
	I have seen dementia residents have purpose and relax in a garden. My own grandfather worked his garden till he was 90 with crutches (he had hip replacment about 1960)Their is need for it.	1
	I install low maintenance perennial gardens for clients, many of which are elderly or suffering physical handicapps. There is an obvious link between their involvement with the garden and an increased sense of well-being and overall purpose in life.	1
	I know myself that having plants in the work area is very relaxing. also every time I work in any of my gardens I feel relaxed.	1
	I know of some hospital in Chattanooga that are using horticultural therapy and I work with Hosanna House, home for brain damaged young adults that have it.	1
	I learned about this program in the MG program I worked with in Prince william County. I took a class at VT at Blacksburg, during our MG training there. We built planter for use with wheel chairs., for use at the county run adult day care. Lowes, Home Depot, and others to donate materials.	1
	I see a big need for it in long term care facilities especially. One of the methods to deal with feeling "bad" listed by our patients is to work in the dirt! Seems to help, and is a normalizing activity.	1
	I think Horticultural Therapy even in school, starting at the primary level, with students, could help with higher self esteem. Helping to create and maintain the grounds where they spend so much of there time. Being proud of being a part of their enviroment and their image. It is something they take with them to their own private spaces where ever they are.	1
	I think it would be a great benefit to nursing homes and rehab type settings but we are a small rural general hospital and I can't see how it would be useful to us in our acute setting since our pts are either nursing home type patients that need acute services or patients that are here for a short period of time.	1
	I think that horticultural therapy has positive benefits for people involved. I certainly don't think it could hurt anyone. We have such beautiful land in Tennessee it seems natural to encourage our citizens to be a part of planting and caring for it.	1
	I think that most people would have no idea about all of this	1
	I think there are many qualified persona(Master Gardners,etc) who would be willing to help or even be hired to assist	1
	I think this is an excellent idea. We have a 17 bed adult psych. unit and it seems as it would be ideal for that setting. I would appreciate any information on this subject.	1

	I think your survey was erroneous in assuming everyone was working in an institution, there should have been a N/A i.e., not applicable answer to some of the questions. They had to be answered, yet no answer truly applied. Therefore I think my answers shouldn't be used in your survey data.	1
	I use indoor plants at my employment for enjoyment and conversation. I know that my gardening is a stress relief from my day.	1
	I worked in rehab prior to acute care and did some minor horticulture therapy on my own with our patients (planting and caring for annuals, perennials, shrubs, etc). If the therapy is not recognized and reimbursed by Medicare and/or other insurances, you will find it incredibly difficult to get it started and practiced in the various therapy settings. Volunteers would probably be your only way.	1
	I would be very interested in learning more about this	1
	I would like a HT certification program to be available in Tennessee. I would attend it if it was near Nashville, and would be glad to teach it in the future if needed, once I was trained.	1
	I would like to see more Horticultural Therapy in Tennessee	1
	I would love to see it available for children in public schools.	1
	I would love to see local governments participate in horticultural therapy. I also think the programs should not leave out children- I can see how they could greatly benefit from it, maybe more so than adults.	1
	If you are trying to incorporate horticultural therapy in programs for the elderly, I think you should target the activities directors at nursing homes/assisted living centers for training. Also, possibly have the training as an elective in a degree program.	1
	Ijams used to have a program in teh late 1990's I believe	1
	In Illinois I worked in the Hort Therapy program run my that states Master Gardeners. This program was very successful and a favorite of the residents of the nursing homes. I personally witnessed some miraculous results from the program. It was often the highlight of the week for these people and gave them something to look forward to.	1
	IN MY OPINION, HORTICULTURAL THERAPY IS UNDER VALUED AND UTILITZED IN TENNESSEE. THROUGH PUBLIC AWARENESS AND EDUCATION, MANY CITIZENS OF TENNESSEE WOULD BENEFIT FROM HORTICULTURAL THERAPY PROJECTS.	1
	It's an alternative therapy program, so why not?	1
	Most of the older people in this area were farmers or relied on gardens to feed their families. I think horticultural therapy would be of great value in retirement and nursing homes as well as with the mentally and physically handicapped.	1
	My one experience with theraputic horticulture was in an assisted living facility where my mother-in-law was resident. The program gave the residents a lie in to their previous lifestyle activities, the sense of acomplishment from growing and nuturing plants and the ability to participate in a purposeful outdoor activity.	1
	No	1
	Non professionals would benefit from training- as volunteering at assisted living facilities, etc.	1
	None	2
	People are incresingly cut off from the natural world. In times of physical crisis, they crave its contact whether they know it or not.	1
	people of all ages would benefit...I work with small children and they love anything relating to nature.	1

	possible class on horticultural therapy as there is a master gardener class in tenn	1
	Putnam County Master Gardeners have been approached by our local hospital to create a "healing garden" at the cancer center that cancer patients may enjoy. We will undertake this project in 2008.	1
	Since I am retired and only work in the gardens with other retired friends to maintain the front gardens at our local nursing home, I do not believe you can count any of your obligatory questions regarding, "institution".	1
	Since I am retired many of the questions you asked were not applicable to me and my situation.	1
	sounds like a great mechanism to reduce stress/anxiety and take a cognitive approach toward healing	1
	The caring and nuturing of plants can do amazing things for the mind and soul.	1
	The need for therapy of any kind is driven by a desired end result. Horticultural Therapy would be an avenue that would appeal to those who have an interest and desire for experiences with nature. I think what would be exciting is the ability to expose people who did not realize what Horticultural Therapy could do for them. There is much to be said for the explosion of gardening as America's #1 hobby. People are enjoying the therapeutic aspect of gardening without really realizing that they are taking part in a form of therapy. However, this "hobby" can get out of hand and begin to be a stressful outjonesing contest. The value of the relaxing and calm nature of gardening would be gone.	1
	The wording in this survey is somewhat confusing in that it appears to be specifically targeting healthcare or related institutions. This was forwarded to me through the Tennessee Master Gardener program, but I own a small pick-your-own blueberry farm and my wife and I are both Master Gardeners in Tennessee.	1
	There is a definite need for HT in Tennessee as well as the rest of the country. I love the idea of having a viable program here. My dream is to make my garden wheelchair accessible for the local nursing homes and organizations that help the disabled. It is a dream and I have the land to do it AND I am retired, so I believe in HT with a vengence.	1
	this is a needed service as so many people are living longer and xo many times they end up out of there home envioment. Gardens and working in them add so much to our lives.	1
	This is a wonderful concept. My mother is 83, has had two knee replacements plus back problems. I built her a 4-foot high bed to garden in and she thrives with this. She is pretty active for her age and condition, but her gardening (vegetables and flowers) keeps her active in the spring and summer and gives her the exercise she needs to keep everything running smoothly. I would say this is extremely beneficial to my mother and would also be to many others.	1
	This is not a subject that I hear alot about, but think that such a program could have many positive effects on individuals and a community as well.	1
	This is something I am extremely interested in and have considered going into the field when I graduate.	1
	TN has so much to learn, their views on animal - as well as plant - therapy are just about at the stoneage level.	1
	Very calming and theraputic activity and I would like to see it promoted in Nursing Homes and Skilled Care Faciities.	1
	we need grief therapy gardens	1
	we seem to be a bit behind the times. Other states have HT services and programs.	1

	Your questions are poorly written and are not applicable to most of the participants. I would suggest that the questions be reworded and then resubmitted.	1
	Total	282

Appendix C. Suggested Plant List.

Annuals

African Marigold	*Tagetes erecta*
French Marigold	*Tagetes petula*
Scented-Leaves Geraniums	*Pelargonium tomentosum*
	Pelargonium x fragans
	Pelargonium Odorattisimum
Moss Rose	*Solenostemon scutellarioides*
Joseph's Coat	*Amaranthus tricolor*
Coleus	*Solenostemon scutellarioides*
Zinnia (spreading)	*Zinnia angustifolia*
Mexican Zinnia	*Zinnia haageana*
Ornamental Pepper	*Capsicum annuum*
Lantana	*Lantana camara* ''Feston Rose' or 'Radiation"
Impatients	*Impatients walleriana*
	Impatients hawkeri
Dusty Miller	*Senecio cineraria* 'Silver Dust"
Flowering Cabbage	*Brassica oleracea*
Begonias	*Begonia* rex Cultorum Hybrids
	Begonia sempreflores
	Begonia x tuberhybrida

Perennials

Coral Bells	*Heuchera sanguinea*
	Heuchera Americana
Creeping Thyme	*Thymus serphyllum*
Cardinal Flower	*Lobelia cardinalis*
Jack-in-the-Pulpit	*Arisaema triphyllum*
Artemisia	*Artemisia ludoviciana* cultivars
Wild Columbine	*Aquilegia Canadensis*
Purple cornflower	*Echinacea purpurea*
Aster	*Aster X frikartii*
	A. novae-angliae
	A. novi- belgii
Wild Bleeding Heart	*Dicentra eximia*
Black- Eyed Susan	*Rudbechia fulgida*
	R. triloba
Hostas	*Hosta sieboldiace* 'Elegans','Francee',
Lamb's Ears	*Stachys byzantina*
Blazing Star	*Liatris* sp.
Wild Blue Phlox	*Phlox divaricat*
Sedum	*Sedum reflexum*

	S. spurium
	S. spectabile
Spiked Speedwell	*Veronica spicata* 'Red Fox'

Trees & Shrubs

Butterfly Bush	*Buddleia alternifolia*
	B. davidii
Carolina Allspice	*Calycanthus floridus*
False Cypress	*Chamaecyparis* sp.
Japanese Crape Myrtle	*Lagerstroemia fauriei* 'Fantasy'
Spirea	*Spiraea nipponica* 'Snowmound'
Smilacina, Salomon's Plum	*Smilacina racemosa*
Juniper	*Juniper conferta*
	J. horizontalis
	J. procumbens
	J. squamata 'Blue Arrow'

Vines

Virgin's Bower	*Clematis virginiana*
Hyacinth Bean	*Dolichos lablad*
Passion Flower	*Passiflora incarnate*
Yellow or Small	*P. lutea*
Coral Honeysuckle	*Lonicera sempervirens*
Crossvine	*Bignonia capreolata*
Scarlet Runner Bean	*Phaseolus coccineus*

Herbs

Chives	*Allium schoenoprasum*
Lavender	*Lavandula angustifolia*
Lemon Balm	*Melissa officinalis*
Basil	*Ocimum sp.*
Thyme	*Thymus* x citrodorus
	T. vulgaris
Rosemary	*Rosmarinus officinalis*
Oregano	*Origanum vulgaris*
Mint	*Mentha x piperata* 'Chocolate'
	M. x piperata citrate
	M. spicata
Parsley	*Petroselinium crispum*

Ferns

Ebony Spleenwort	*Asplenium platyneuron*
Maidenhair Fern	*Adiantum pedatum*
Southern Lady Fern	*Athryrium filix-femina*

Cinnamon Fern	*Osmunda cinnamomea*
Royal Fern	*Osmunda regalis*
Bracken Fern	*Pteridium aquilinum*

VITA

Jenny Pfeffer was born in Caracas, Venezuela. In her early years of college life in Caracas, she went to the school of architecture. In the early 1980's, Jenny came to the United States to complete her B.S. in Ornamental Horticulture and Landscape Design at the University of Tennessee (UT), in Knoxville. In 1984, she went back for ten years to her native Venezuela. Ten years later, she moved back with her second husband to live in Florida for good, raising a family and owning an import wholesale business in watches with her husband. Meanwhile, she tried to keep in touch with plants by volunteering at Fairchild Tropical Botanic Garden in Miami, Florida; being a Master Gardener for Broward County, and taking courses on plant identification at Broward Community College.

Jenny moved back to Knoxville, Tennessee with her family, and she worked at Cherokee Health Systems and the Department of Human Services before returning to UT to pursue a Masters' degree in Horticultural Therapy under the supervision of Dr. Dennis Deyton. During her graduate student years, Jenny focused on developing skills in horticultural therapy. In 2007, she graduated with a M.S. in Plant Sciences, with a concentration in Horticultural Therapy. At the present moment, she is living with her family and working at Sertoma Center in Knoxville, Tennessee.